VIDEO SELF-MODELING WITH ELEMENTARY SCHOOL STUDENTS DISPLAYING BEHAVIORAL ENGAGEMENT DEFICITS DUE TO ACQUIRED BRAIN INJURY

by

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A dissertation submitted to the faculty of
The University of Utah
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

Department of Educational Psychology

The University of Utah

May 2018

The University of Utah Graduate School

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ABSTRACT

The term “Acquired Brain Injury (ABI)” encompasses a wide range of noncongenital injuries, including stroke, brain surgery, and encephalitis, with traumatic brain injury (TBI) being most prominent in the research. TBI has been called a “silent epidemic,” with an estimated 1.7 million new TBIs occurring in the United States each year. Executive function deficits are among the most common problems following a TBI, including increased distractibility, off-task behavior, and impaired initiation. These deficits can lead to significant complications in students’ functioning across settings, especially in the classroom, resulting in decreased concentration and work completion. Experts recommend using interventions that have been shown to be efficacious with other populations displaying similar challenges, but few interventions have been validated specifically with individuals who have TBIs.

Video self-modeling, a specific form of video modeling, is an established and cost-effective procedure that can facilitate and increase a variety of adaptive and positive behaviors, particularly on-task behavior in the classroom. To date, only two studies have been identified that have assessed the use of video modeling or video self-modeling with individuals with TBI. Both included adult participants and focused on teaching an adaptive behavior; one targeted expressive language and the other taught independent cooking skills. These studies show promise for the application of video modeling interventions with individuals with TBI. Video modeling and video self-modeling have been shown to help students with and without identified disabilities to make gains in behaviors that contribute to different types of student engagement (e.g., on-task behavior and social communication), but have yet to be tested in a school setting with students with TBI. The present study sought to explore the use of video self-modeling to increase academic engagement in elementary school students with confirmed histories of ABI. Three participants with different brain injuries (anoxia, brain tumor, and TBI) participated to create self-modeling videos to increase on-task and productive, initiatory behaviors in the classroom setting. Results indicated a moderate treatment effect overall for on-task behavior, and variability in response was noted between participants. Considerations for these results in the target population are explored, and concerns outlined with each type of injury represented in the study. Limitations, suggestions for future research, and implications regarding best practice for school psychologists are discussed.

For Betty Lou, who wasn’t here to be patient with limits

TABLE OF CONTENTS

LIST OF TABLES

Tables

LIST OF FIGURES

Figures

ACKNOWLEDGMENTS

I would like to thank my committee chair, Dr. Aaron Fischer, and my committee members for their support and guidance through this process. I am also grateful to the participants and their teachers for their willingness and desire to better serve students by advancing our understanding through research. Thank you to Robyn Riley, who truly went above and beyond the call of duty at every turn, and to Weston Lindbeck for making the tech happen.   And thank you to Lance; you know what you did.

CHAPTER 1

INTRODUCTION AND LITERATURE REVIEW

Acquired Brain Injury

Acquired brain injury (ABI) refers to any injury that damages brain tissue (Deutsch Lezak, Howieson, Bigler, & Tranel, 2012) that is not related to a congenital or a degenerative disease. It encompasses events such as anoxia, encephalitis, traumatic brain injuries (TBI), brain tumors, strokes, epilepsy, and so forth. (Rees, 2016). While TBI is among the most common causes of long-term disabilities in children (Treble-Barna et al., 2017), many clinicians note that definitions of TBI can conflict with each other and create unnecessary exclusion of impairments due to anoxia, stroke or other etiologies (Deutsch Lezak et al., 2012). Indeed, Hopkins, Tate, and Bigler (2005) concluded that functional outcomes were primarily influenced by the amount of tissue loss, not etiology of the injury, in comparing participants with traumatic and anoxic brain injuries.

TBI is the most commonly researched form of ABI in the school intervention literature, yet few interventions have been directly validated with this population. Research and guidelines for school interventions with students following other ABIs, such as brain tumors, are even more limited, despite the significant increase in survival rate and subsequent return to school for these students (Donnan et al., 2015; Gorin & McZuliffe, 2009). The present study involved three participants with three very different

ABIs: childhood brain tumor, TBI, and anoxia. This review will focus on TBI, as it is the most well-researched form of ABI in the school intervention literature and is often the preferred point of reference for interventions with individuals with other causes of ABI (Begyn & Castillo, 2010; Rees, 2016).

Traumatic Brain Injury

As the discourse surrounding TBI continues to grow and evolve, the need for prevention and intervention strategies has become a topic of greater discussion. High-profile cases in professional athletics continue to raise public awareness of the challenges and impairments associated with TBI. Additionally, the return of increasing numbers of combat veterans signals an urgent need for greater understanding of TBI, as these individuals undertake the challenges of rehabilitation from injury and readjustment to civilian life (Gubata et al, 2014). Unfortunately, TBI is a public health concern that far exceeds the parameters of the current national conversation, and the broader effects of TBI in the general population remain a "silent epidemic" (Roozenbeek, Maas, & Menon, 2013, p. 231).

Traumatic brain injury (TBI) is generally defined as injury to the brain due to an external force, causing temporary or permanent impairment of one's ability to regulate cognitive, physical, emotional, and behavioral functioning (Farmer, Clippard, Luehr-Wiemann, Wright, & Owings, 1997). Schachar, Park, and Dennis (2015) added to this definition the criterion of displacement of the head without external trauma to the skull. Morrison (2010) noted that two types of TBI are generally recognized: closed injuries, which involve impact from an external object or force, and open injuries, where an object penetrates the skull and disturbs the meninges that surround the brain. The former has a variety of causes, such as automobile accidents and falls, while the latter is most often due to gunshot wounds (Morrison, 2010). Roozenbeek and colleagues (2013) and Hawley, Ward, Magnay, and Long (2002) suggest that global prevalence rates of TBI are on the rise, due in large part to increasing use of motorized vehicles worldwide. However, they also note that high-quality prevalence data are lacking because cases of TBI are typically reported in the context of emergency room visits and hospital admissions. This results in the exclusion of unknown numbers of people who do not seek medical treatment for a variety of reasons, and reports do not differentiate first-time injuries from those with a preexisting history of TBI. Additionally, many of these data are tracked through codes from two different editions of the International Classification for Diseases (ICD), with some countries utilizing the ICD-9, while others have moved to the ICD-10. The variability in definitions between the ICD-9 and the ICD-10 raises concerns in epidemiological reports. In addition, the codes are used primarily for administrative purposes with limited application to research (Roozenbeek et al., 2013).

In the United States, it is estimated that there are approximately 5.3 million people (roughly 2% of the population) who are living with a disability caused by a TBI (Morrison, 2010). Roozenbeek and colleagues (2013) reported that about 1.7 million people sustain a TBI each year in the United States. However, the annual number of fatalities due to TBI does appear to currently be static. (Stein, Georgoff, Meghan, Mizra & Sonnadd, 2010). In analyzing this population, separating prevalence into age groups can be difficult. The Centers for Disease Control [CDC] reported 473,947 TBI-related emergency room visits for children age 14 and under in 2010 alone (CDC, 2010). Older reports suggest that this represents a small fraction of annual pediatric head injuries, and have suggested that the total number of new pediatric TBIs sustained each year is near 5 million (Wilkening, 1997). It is difficult to make definitive statements about the prevalence of pediatric TBI, but Morrison (2010) noted that the majority of pediatric brain injuries observed are closed head injuries. Schachar, Park, and Dennis (2015) also reported a staggering disproportionality in the rate of childhood injuries, estimating that one in thirty children will have a TBI by age 16, with more than two-thirds of those reported in males.

Risks and Considerations

Understanding the prevalence and impact of pediatric TBI is critical to optimizing outcomes, as it has been suggested that brains that suffer damage or insult during childhood can reorganize and "do more with less" (Kolb & Whishaw, 2009, p. 682). Recovering from a childhood brain injury is not, however, an automatic process, and it is vital that those who conduct assessments and interventions keep the process of child development in mind, as injury may alter brain development (Taylor, 2010). Farmer and colleagues (1997) stated the following with regard to the rehabilitation process:

> Children who sustain moderate to severe traumatic brain injuries (TBI) present unique challenges to rehabilitation and school professionals. Unlike adults with TBI, children are in the midst of rapid development changes in physical, cognitive and behavioral functioning…In the weeks and months that follow an injury, recovery and developmental processes become intertwined and unfold together, each with specific influences on the child. (p. 33)

Given the complexity of assessment and rehabilitation with pediatric TBI, it follows that a treatment team with individuals who have a variety of areas of expertise would be of greater benefit to the child than limiting his/her treatment plan to the insight and planning of a single professional. Farmer and colleagues (1997) recommend a multidisciplinary team approach to assessment and rehabilitation. The authors also suggest that the goal of such a team should be reintegration into home and school settings following the injury, and they recommend that family members and educators be considered integral members of the multidisciplinary team.

The multidisciplinary team approach can also function in a preventive capacity. Hanson and Clippard (1992) noted that academic problems, school failure and the need for special education services are well documented for children who have sustained a TBI (Hawley, 2005). Risk of alcohol abuse in later years also appears to be higher for individuals with ABIs (Kreutzer, Witol, & Harris Marwitz, 1997), along with the risk of depression and other psychiatric concerns (Matuseviciene, Borg, Stalnacke, Ulfarsson, & De Boussard, 2013; Schachar, Park, & Dennis, 2015). Furthermore, those who have experienced a TBI are at increased risk of further injury (Hawley et al., 2002), which in turn is associated with increased incidence of psychiatric conditions and neurodegenerative diseases such as chronic traumatic encephalopathy (CTE), Alzheimer’s disease, Parkinson’s disease, and amyotrophic lateral sclerosis (Little et al., 2014).

Long-term risks and prognostic concerns highlight the need for early rehabilitation and interventions in this population, particularly in individuals whose symptoms persist for three or more months after sustaining the injury (Matuseviciene et al., 2013). TBI is the most common cause of acquired disability in childhood (Michaud, Duhaime, & Batshaw, 1993) and research has demonstrated that without effective intervention, behavioral, academic, and psychological problems interact with and compound upon one another (Jimerson & Ferguson, 2007; Severson, Walker, Hope-Doolittle, Kratochwill, & Gresham 2007). While there are many concerns related to TBI, proactive provision of support and intervention following the injury can serve to mitigate these risks and challenges. Unfortunately, many children with TBIs remain unidentified and misunderstood when they return to school, and many do not have post-injury evaluations (Hawley, 2004). This leaves much of the responsibility of meeting the child's needs to school personnel, who are uniquely positioned to do so.

Traumatic Brain Injury in the School Setting

Schools are potentially well-suited to provide support and structure following injury (Hawley, 2005; Linden, Braiden, & Miller, 2013) and are mandated by federal and state laws to address the needs of students whose injuries have resulted in disabilities (Dwyer, Rozewski, & Simonsen, 2012). The Individuals with Disabilities Education Improvement Act of 2004 (IDEA, 2004) entitles students with disabilities to a free and appropriate public education (FAPE) and provides the following definition of TBI:

> Traumatic brain injury means an acquired injury to the brain caused by an external physical force, resulting in total or partial functional disability or psychosocial impairment, or both, that adversely affects a child's educational performance. Traumatic brain injury applies to open or closed head injuries resulting in impairments in one or more areas, such as cognition, language, memory, attention, reasoning, abstract thinking, judgment, problem-solving, sensory, perceptual, and motor abilities, psychosocial behavior, physical functions, information processing and speech. Traumatic brain injury does not apply to brain injuries that are congenital or degenerative, or to brain injuries induced by birth trauma. (Individuals with Disabilities Education Improvement Act, 2004, §300.8.c.12)

Definitions of TBI can vary somewhat across states, as Colorado law specifies that "anoxia due to trauma" is included under the category (Vaughn, 2014, p. 14). In contrast, Utah utilizes a definition that is identical to that in IDEA (Utah State Board of Education, 2013, p. 50). However, students who do not qualify for an Individualized Education Plan (IEP) under the classification of TBI may qualify under the category of Other Health Impairment (OHI) or receive support on a 504 plan (Rehabilitation Act of 1973). Support strategies in schools range drastically from as-needed accommodations to self-contained special education services. With the level of variability that occurs across individuals with TBIs, interventions need to be individualized to suit the student's needs (D'Amato & Rothlisberg, 1997; Kehle, Clark, & Jenson, 1997; Mateer et al., 1997). The variability in these students' needs and the complexity that can occur in individual cases highlight the necessity for a multidisciplinary team approach.

Behavioral Concerns

Students with TBI present with a range of challenges that vary across individuals, but can include problems with socialization, speech, motor function, cognitive abilities and behavior. With this population, it is important to be aware of a broad range of behavioral possibilities, as a number of changes in emotion and behavior are common following TBI (Deutsch Lezak et al., 2012; Hawley, 2005). Following a TBI, families often report behavioral disturbances to be more distressing than cognitive deficits (Morrison, 2010) and they report the same behaviors as parents of children with behavior disorders (Kehle et al., 1997). Kehle and colleagues (1997) noted the following similarities between the two groups: poor attention and concentration, distractibility, hyperactivity, irritability, low frustration tolerance, poor motivation, apathy, poor anger control, aggression, anxiety, social isolation, and elevated rates of substance abuse (p.

135). Taylor (2010) reported that behavior problems were judged to be significantly related to TBI only if at least 2 years had passed since the injury. The trend appears to be consistent across levels of TBI severity (Max, Koele, et al., 1998), though one study demonstrated that children with milder injuries demonstrated more oppositional/defiant symptoms and behaviors (Max, Lindgren, et al., 1998).

Several studies have suggested an overlap between the symptoms of TBI and developing or increasing symptomatology related to attention deficit hyperactivity disorder (ADHD; Mateer et al., 1997; Max, Lansing, et al., 2004; Max & Dunisch, 1997; Taylor, 2010), as well as oppositional defiant disorder (ODD) and conduct disorder (CD) (Max & Dunisch, 1997; Taylor, 2010). The criteria for each of these disorders are outlined in the DSM-5, with the symptoms of ADHD being key to this discussion, as follows (APA, 2013):

1. Inattention: Six or more symptoms of inattention for children up to age 16, or five or more for adolescents 17 and older and adults; symptoms of inattention have been present for at least 6 months, and they are inappropriate for developmental level:
   a) Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or with other activities.
   b) Often has trouble holding attention on tasks or play activities.
   c) Often does not seem to listen when spoken to directly.
   d) Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., loses focus, side-tracked).
   e) Often has trouble organizing tasks and activities.
   f) Often avoids, dislikes, or is reluctant to do tasks that require mental effort over a

long period of time (such as schoolwork or homework).

g) Often loses things necessary for tasks and activities (e.g., school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones).

h) Is often easily distracted.

i) Is often forgetful in daily activities.

2. Hyperactivity and Impulsivity: Six or more symptoms of hyperactivity-impulsivity for children up to age 16, or five or more for adolescents 17 and older and adults; symptoms of hyperactivity-impulsivity have been present for at least 6 months to an extent that is disruptive and inappropriate for the person’s developmental level:

   a) Often fidgets with or taps hands or feet, or squirms in seat.

   b) Often leaves seat in situations when remaining seated is expected.

   c) Often runs about or climbs in situations where it is not appropriate (adolescents or adults may be limited to feeling restless).

   d) Often unable to play or take part in leisure activities quietly.

   e) Is often "on the go" acting as if "driven by a motor."

   f) Often talks excessively.

   g) Often blurts out an answer before a question has been completed.

   h) Often has trouble waiting his/her turn.

   i) Often interrupts or intrudes on others (e.g., butts into conversations or games)

In addition, the following conditions must be met:

a) Several inattentive or hyperactive-impulsive symptoms were present before age 12 years.

b) Several symptoms are present in two or more settings (such as at home, school, or work; with friends or relatives; in other activities).

c) There is clear evidence that the symptoms interfere with, or reduce the quality of, social, school, or work functioning.

d) The symptoms are not better explained by another mental disorder (such as a mood disorder, anxiety disorder, dissociative disorder, or a personality disorder). The symptoms do not happen only during the course of schizophrenia or another psychotic disorder.

Additional studies have suggested that the presence of ADHD symptoms following TBI may increase the probability that the child will later meet the criteria for ODD or CD (Max, Lindgren, et al., 1998; Max, Koele et al., 1998; Max, Lansing, et al., 2004). The prevalence of ADHD in the general population is usually reported to be about 5% (APA, 2013), but in a cohort of 93 children and adolescents who had sustained TBIs, Taylor (2010) reported a 35.7% prevalence rate of ADHD.

Studies of ADHD and TBI suggest similar neurobiological underpinnings in executive function and dopaminergic components, especially in examining the responses of either population to stimulant and mood-stabilizing medications (Aguiar, Eubig, & Schantz, 2010; O'Shanick, 1998; Perper-Ouakil, Ramoz, Lepagnol-Bestel, Gorwood, & Simonneau, 2011; Taylor, 2010). Medication can offer additional support across settings, but its utilization can vary based on caregiver attitudes, resources and access. Of pressing concern in a school setting is the behavioral overlap of ADHD and TBI, as evidence-based interventions for ADHD may also hold promise for students with TBIs. As mentioned, students with TBIs are at risk for a number of negative experiences and outcomes. Hawley (2003) reported significant behavior problems in two-thirds of her school-age participants who had sustained a TBI. These behavior problems appeared to reflect executive function deficits, particularly distractibility, impulsivity and poor emotional control. These students were more likely to experience formal discipline and permanent exclusion from school.

Even in less severe cases, with or without a TBI, distractibility is an extremely common contributor to academic underachievement (Martin, Drew, Gaddis, & Moseley, 1988; Martin, Nagle, & Paget, 1983). Pelham and colleagues (2010) noted that children with ADHD are at significant risk for poor long-term outcomes because they tend to exhibit impairments in three key domains that consistently predict a variety of outcomes across psychopathologies: peer relationships, parenting, and academic/school functioning. It stands to reason that the risk is similar for students with TBIs, given the overlap in diagnostic and neuropsychological presentations.

The pattern in the research of increased risk and behavioral problems over time highlights the need for proactive and well-prepared school reintegration and the provision of responsive support and intervention with these children as soon as the need is identified. Interventions need to be long-term, as TBI and ADHD are both considered chronic conditions (Pelham et al., 2010). This necessitates interventions that are sustainable, user-friendly and, of course, evidence-based. Behavioral engagement is one area that has been well researched and presents promising possibilities in the discussion of TBI. De Laet and colleagues (2015) defined behavioral engagement as "the extent to which children participate in learning activities and nonacademic activities in school, attend school, and display positive conduct" (p. 1292). To engage effectively requires adequate function and/or support of underlying processes, most notably executive function.

The Role of Executive Function

Many of the challenges that students with TBIs experience are similar to those of children with other disabilities in educational settings. Some of the most common impairments associated with TBI involve executive function, meaning those capacities generally associated with the frontal lobe "that enable a person to engage successfully in independent, purposive, self-directed and self-serving behavior" (Deutsch Lezak, Howieson, Bigler, & Tranel, 2012, p. 37). Morrison (2010) explains, "the shape and structure of the skull and its relation to the anterior portions of the frontal lobe and bilateral temporal lobes leave the circuitry involved in attention and executive functioning at risk" (p. 800). Impairments in executive function can limit skills related to self-care, independence and socialization, causing deficits that can be an impediment to academic progress, contribute to increasing frustration, and impact relationships with teachers (Hawley, 2005).

There are two additional considerations that are critical in the discussion of executive function following a TBI: attention and working memory (Lord-Maes & Obrzut, 1997; Maricle, Johnson, & Avirett, 2010). Maricle and colleagues (2010) warn that assessing executive function without considering these systems can be detrimental and result in inaccurate interpretation of assessment results. Attention and working memory need to be clearly defined in order to illustrate their interwoven relationship with executive function. Deutsch Lezak and colleagues (2012) note that definitions of attention vary considerably across sources, and they specify two primary categories of attention: reflex and voluntary. Reflex attention refers to automatic processes such as responding to one's own name, while voluntary attention is a controlled process which is necessary for activities such as the completion of schoolwork. The authors recommend conceptualizing attention as "a system in which processing occurs sequentially in a series of stages within the different brain systems" (Deutsch Lezak et al., 2012, p. 36). Problems with attention are a common feature of ADHD (APA, 2013), which is often diagnosed secondary to TBI, and can have a significant negative impact on a student's level of engagement in the classroom.

Engagement is a complex concept, and an understanding of memory systems and their impact on executive function is important in conceptualizing the impact that TBI can have on a student's level of engagement at school. Memory is defined as a set of systems that facilitate short and long-term retention of information and skills (Deutsch Lezak et al., 2012). Deutsch Lezak and colleagues (2012) distinguish two primary types of memory: declarative and non-declarative. Declarative memory refers to explicit memory for information and events that can be "brought to mind and inspected in the mind's eye" (Deutsch Lezak et al., 2012, p.27). Nondeclarative memory deals with the learning of procedures and skills, as well as reflexive mechanisms related to classical conditioning. Memory is an important function for task attention and completion, and deficits in memory can contribute substantially to problems in executive function (Maricle et al., 2012). It is impacted by factors such as cognitive fatigue, processing speed, attention and concentration, which are common areas of difficulty following TBI (Morrison, 2010). It is easy to imagine the impact that such challenges would have on a student's engagement in the classroom.

The intersection of engagement problems in TBI with other disorders and behavioral concerns necessitates a closer examination of relevant definitions. It should be noted that "engagement" has considerable overlap with definitions of "on-task." Wang, Bergin, and Bergin (2014) define classroom engagement as a student's "active involvement in classroom learning activities" (p. 517), including "attention, interest, investment and effort students expend in the work of learning" (Marks, 2000, p. 155). Ducharme and Shecter (2011) consider a student to be on-task when he or she is "actively engaged in classroom activities that facilitate learning and not engaged in behaviors that detract from learning" (p. 266). Ponitz, Rimm-Kaufman, Grimm, and Curby (2009) define engagement as "correspondence between the child's observable behavior and the demands of the situation, including attending to and completing tasks responsibly, persisting in the face of difficulty, and exercising self-control" (p. 104). Nystrand and Gamoran (1989) propose two types of engagement: procedural and substantive. Procedural engagement reflects an adaptation to the classroom rules and routines, lasting as long as the expected task. Substantive engagement requires a sustained dedication to academic content and study that promotes academic achievement.

TBI does present some unique challenges to student engagement and success. Deutsch Lezak and colleagues (2012) note that one particularly challenging deficit in executive function is anergia, or impaired initiation, decreased or absent motivation, and problems in planning and completing sequences of activities related to goal-oriented behaviors. The authors note that this can be a particularly difficult behavior to notice in a highly structured and often one-on-one setting such as a neuropsychological assessment clinic. In settings with more variable structure, such as schools, the deficit may be more noticeable if staff members are aware that it is a possibility. Educational teams should be mindful of this concern, as anergia involves a lack of academically adaptive skills, an absence that can be inconspicuous in the presence of externalizing behaviors (Weitman, 2006). It should also be noted that anergia is among the more stable indicators of depression following TBI, a problem that can persist for years after the injury (Jorge, Robinson, & Arndt, 1993). This is another important factor for educational teams to keep in mind, as emotional variables play a role in academic success and general well-being (Kovacs & Goldston, 1991).

Intervention Guidelines With TBI

It is important to note that TBIs have a broad spectrum of presentations and developmental differences that are unique when compared to other disabilities, and these students' services need to be monitored and individualized as much as possible (D'Amato & Rothlisberg, 1997; Morrison, 2010). School intervention research for students with ABIs or TBIs is still sparse, so experts advise the use of interventions that have proven successful with other disorders resulting in similar behaviors (Kehle et al., 1997). This is likely one of the most straightforward guidelines available, as literature supporting well-established interventions for TBI is rather scarce and practitioners are advised to "remain vigilant in attempting to ascertain those techniques and systems that are borne out in the literature" (Morrison, 2010, p. 811). Ultimately, practitioners have a responsibility to guide interventions with research and target the problems of individuals with TBIs with interventions that have been validated for other causes in different contexts. This conundrum underscores the need for greater investigation into the efficacy of interventions with individuals with ABIs.

Relevant information from related disorders provides only one guide in individualizing treatment for a TBI. Tate (1997) states that clinical treatment usually relies on assessment results to guide strategies to address memory problems following TBI. However, some authors support the use of more systematic training through repetition of operations related to impaired functions in order to address problems in daily function that are related to cognitive deficits following TBI (McGraw-Hunter, Faw, & Davis, 2006; Tate, 1997). Success has been noted in repeated stimulation of impaired operations, provided the intervention takes into account the individual's abilities and functional levels. Some authors have suggested that a training effect can help to activate damaged systems, and may stimulate a collateral effect in neighboring areas of the brain (Robertson, Tegner, Tham, & Nimmo-Smith, 1995; Sturm, Willmes, Orgass, & Hartje, 1997), which is consistent with Tate's (1997) recommendation of systematic training, as well as her suggestion of functional reorganization. Video modeling, discussed in detail below, represents a possible intervention that may help to provide systematic training and stimulation of impaired operations in a modality that is sustainable and cost effective.

Staff Preparedness and Responding

Despite the necessity for readiness to approach a broad range of needs and referral concerns, school personnel may be unprepared to address the challenges of students returning to school following a TBI (Linden et al., 2013). Linden and colleagues (2013) indicated that misconceptions about TBI are common among school personnel, particularly with regard to working memory. Additionally, information tends to be poorly disseminated when a child changes schools, and in one study, fewer than two-thirds of students identified as needing special education services due to TBI actually received them (Hawley, 2002). Furthermore, the misconception that bumps on the head are typical childhood experiences remains common, and some authors suggest that this can contribute to a lack of vigilance among school personnel with regard to head injuries (Linden et al. 2013).

Linden and colleagues (2013) also identified some common societal barriers within the school environment for students with TBIs: poor communication and negative attitudes, lack of knowledge and resources, and underestimation of the importance of reintegration (p. 93). They mention attitude as being particularly important, as adult survivors of TBI are often perceived in the general public as "unproductive, untrustworthy, and lacking in pride" (p. 93). The authors surveyed educators to assess knowledge, attitudes, and preparedness with regard to students with TBIs. They noted that participants who knew someone with a TBI or had taught a student with a TBI tended to be better informed on the subject. Interestingly, there did not appear to be a significant difference in knowledge regarding TBI between educators with and without TBI-specific training experiences. The authors recommended that schools increase proactivity with regard to acquiring information from parents about events that may have an impact on learning.

Hawley (2005) discussed the additional possibility that the nature and content of a teacher's subject may directly impact his/her attitudes about his/her students with TBIs. The author reported the case of an 8-year-old male who survived a frontal skull fracture when he fell from a work surface onto a concrete floor. Following 6 weeks of recovery, he began reintegration in school and was reported to have retained above average intelligence. His behaviors of concern were primarily in areas related to executive function: impulsivity, hyperactivity, and emotional lability. Follow-up data were collected at ages 12 and 13, and his teachers were surveyed twice per school year in each instance. The author noted that the student's behavior at home and at school had deteriorated over the years, with a marked tendency toward substantially worse behavior in less structured classes that focused on self-expression (e.g., art). Teachers in these less structured subjects were more likely to use more critical language when describing him than were teachers of subjects such as math and science. This example highlights the importance of educating all personnel who work with a student with a TBI, rather than focusing solely on special education and related service providers.

With that in mind, special educators and related service providers are uniquely positioned to support and advise general education staff in helping students with TBIs succeed in the school setting. Special education teams combine the expertise of different fields to assess and meet the needs of these students. The school day also provides a consistent routine, with opportunities for additional support throughout the day.

It should be acknowledged that the demands on educators, school psychologists, and administrators are as diverse as the challenges of the students they serve. There are 13 different disability categories listed under IDEA (2004): autism, deaf-blindness, deafness, hearing impairment, emotional disturbance, intellectual disability, multiple disabilities, orthopedic impairment, other health impairment, specific learning disability, speech/language impairment, traumatic brain injury, and visual impairment (National Dissemination Center for Children with Disabilities, 2012). The variation in the type and degree of students' special needs necessitates a range of expertise that is unique to a school setting, highlighting the necessity for training educators to address the unique needs of students with TBIs.

Foundations for Video Modeling

Video modeling is a behavioral intervention in which the student reviews a video vignette, multiple times each week, that features him/her or a peer performing the desired behavior. In an early study of self-modeling, Lange (1970) applied the tenets of Bandura's social learning theory to conceptualize his application of the intervention. This theory suggests that behavior is learned through observing and modeling the behaviors of others (Bandura, 1977). Bandura (1986) noted that observational learning hypothesizes that cognitive and behavioral changes occur as a result of witnessing others performing similar actions. Thus, modeling is "the process by which an individual or model demonstrates behavior that can be imitated" and that "the modeled behavior can be presented in vivo (live), recorded (e.g., filmed, videotaped), or imagined" (Corbett & Abdullah, 2005, p. 2).

Bandura (1986) named attentional, retentional, production, and motivational processes as being crucial to observational learning. The attentional process refers to the initial observation and perception of a model or event, which requires a level of focus, while retention is the cognitive process whereby the modeled behavior is encoded and stored in the observer's memory (Bandura, 1986; Corbett & Abdullah, 2005). Carroll and Bandura (1986) suggested visual monitoring and cognitive rehearsal as two processes that can enhance retention. Arguably, video modeling facilitates these cognitive processes

(Corbett & Abdullah, 2005) and has been well validated since these early studies (Buggey & Ogle, 2011; Dowrick & Jesdale, 1991).

Initial studies in video modeling explored the intervention's efficacy before portable and handheld technologies were commonly used in classroom settings. These studies applied video modeling with groups of student teachers to assess its utility in their training (Emmer & Sullivan, 1969; Lange, 1970). At approximately that same time, Creer and Miklich (1970) examined Bandura's theory and applied it to create one of the first documented trials of video self-modeling. They used the intervention to increase adherence to an asthma treatment protocol for a patient with behavior problems. These early explorations inspired a number of graduate theses examining video self-modeling to change behavior, with a "mixed bag" of results over the next three decades (Dowrick, 1999).

A refining of procedures and guidelines has led to a repeated demonstration of this intervention's effectiveness across a variety of disorders and a number of behavioral and academic challenges (Bilias-Lolis, Chafouleas, Kehle & Bray, 2012; Kehle, Bray, Byer-Alcorace, Theodore, & Kovac, 2012; Madaus & Ruberto, 2012; Prater, Carter, Hitchcock, & Dowrick, 2012). One well-examined area of concern in a school setting is on-task behavior. Recent studies have used self-modeling or peer modeling, sometimes in conjunction with other intervention strategies, to support an increase in on-task behavior and, consequently, greater academic engagement and success (Babcock, 2013; King, 2012; King, 2013). Babcock (2013) applied self-modeling in an effort to increase the on-task behavior of two male students, ages 6 and 7, who had been diagnosed with Attention-Deficit/Hyperactivity Disorder, Combined Type (ADHD-CT) and had histories of work refusal and noncompliance. The first participant had a mean baseline on-task rate of 12.5%, which increased to 84.5% during the intervention. At 4-week follow-up, his prorated on-task rate was 63%, despite being agitated by a peer's disruptive outburst just outside the classroom. The second participant had a mean baseline on-task rate of 18.75%, with an increase to 37% during the intervention. Because the participant did not show a substantial increase in on-task behavior, the author added a reinforcement component to the intervention. With the addition of positive reinforcement, the participant's mean on-task rate increased to 66.75%; however, he refused to participate in follow-up sessions.

King (2012) applied self-modeling, peer modeling, and self-monitoring to increase rates of on-task behavior in four elementary-aged students, all of whom had IEPs. At baseline, the average on-task rate for participants in the study was observed to be 47%, compared to the mean on-task rates of same-age peers, which was 81%. During the intervention phase, participants' average on-task rate increased to 86%, which was comparable to that of their peers, whose average rate was 85%. The author noted a percentage of nonoverlapping data points (PND) of 100 and a mean global effect size of 5.60. Two of the four participants' parents reported that their children had previous diagnoses of ADHD; one took medication throughout the study and one did not. Where students with TBIs show many similarities to students with ADHD, and current guidelines for TBI suggest the utilization of interventions for analogous disorders, the effectiveness of self-modeling with students with TBIs deserves its own examination.

Initial Considerations for Video Modeling Interventions

Video modeling is typically used to describe a “technique that involves an individual watching a video of a target behavior and then imitating the behavior of the observed model” (King et al. 2014, p. 126). Self-modeling or video self-modeling (VSM) is distinct in that it involves “repeated observations of oneself in videotapes that show only desired behaviors” (Dowrick & Dove, 1980, p. 51). There has been some debate regarding the most effective ways to approach video modeling. One topic within this discussion concerns who the video vignette should feature: is there a difference in outcomes when the video features the target student, compared to a video that features a peer? King and colleagues (2014) indicate that video modeling and VSM are equally effective (Gena, Couloura, & Kymissis, 2005), but that video modeling is less costly and time-consuming because a new video does not need to be created for each child (Charlop-Christy, Le, & Freeman, 2000). However, these publications by Gena and colleagues (2005) and Charlop-Christy and colleagues (2000) are limited to examination of the intervention with participants with autism spectrum disorder, and one form of the intervention may have greater efficacy with certain populations than the other.

The power of any behavioral modeling intervention is partially mediated by how similar the model is to the observer (Schunk, Pintrich, & Meece, 2007), and Prater, Carter, Hitchcock, and Dowrick (2011) argue that, “oneself may be considered the most powerful model of all” (p. 71). In fact, Dowrick (1999) argues that observing oneself should be considered a “learning mechanism in its own right” (p. 36), as it increases the likelihood of the observer performing the behavior in the future. He also asserts that using the self as a model serves the dual purpose of providing the observer with a method for how best to perform the skill, as well as bolstering his or her beliefs in his or her own ability to acquire the skill. Clark, Kehle, and Thomas (1992) supported the idea that self-modeling may increase self-efficacy, adding that the appearance of the target student in the video can also add interest value for the student. Babcock (2013) supported this, reporting anecdotal observations that the participants “appeared particularly interested in the video images of themselves” and that “this was likely a factor that promoted the participants’ attention to the videos, as well as their initial enthusiasm for the intervention” (p. 20).

Many studies identify two forms of VSM: positive self-review and feed-forward (Collier-Meek, Fallon, Johnson, Sanetti, & Delcampo, 2012; Dowrick, 1999; Hitchcock, Dowrick & Prater, 2003). The first, positive self-review, utilizes footage of the student displaying optimal examples of the target behavior. This is the method commonly used to improve on-task behavior (King et al., 2014). Feed-forward videos, by contrast, depict the student demonstrating a behavior that has not yet been achieved or that needs to occur in a new setting. Feed-forward VSM can be used as part of a treatment for selective mutism, for example. Ideally, the child is videotaped speaking in the desired environment, and reviews the video several times, with the goal of increasing the frequency of verbalization in that environment (Kehle, Bray, & Byer-Alcorace, 2011).

Collier-Meek and colleagues (2012) outlined a number of factors that need to be taken into account when considering the use of VSM as an intervention. First, the student must be capable of performing the behavior and be able to attend to a brief video. Not only can the presence of oneself in the modeling video increase the level of interest (Clark et al. 1992), but some have suggested that the use of tablet devices, such as the

Apple iPad, can increase interest in the intervention even more (Babcock, 2013).

Second, the authors recommend providing literature supporting the effectiveness of the intervention to administrators and teachers, as it may be viewed initially as "intrusive or difficult to implement" (Collier-Meek et al., 2012, p. 5). Data supporting the intervention may help to overcome such resistance. The final factor for consideration prior to implementation is the "time needed to plan, record, edit and show the video to the student, as well as evaluate results" (p. 5). In the earlier studies of VSM, the availability of technology and its limited user-friendliness presented barriers to the use of this intervention and made it less accessible and more time-consuming. This has changed with the increased presence of portable and handheld video recording technologies available in classrooms.

The Role of Technology

Some authors suggest that tablet devices have made the intervention more feasible in a school setting, decreasing the time needed to assemble the video and providing a platform for the student to view it regularly (Babcock, 2013; Buggey & Ogle, 2012). iMovie is a mobile application available for the iPad which can be used to record, edit, and display the modeling video. This approach enables the interventionist, whether a teacher, school psychologist, or other school employee, to develop and implement the intervention in a manner that is simplified and time-efficient. Additionally, some tablet-based operating systems allow the user to lock into a selected application, preventing a student from exiting the video application in favor of a game or Internet browsing.

Babcock (2013) implemented a VSM intervention with students with behavior disorders with the aim of improving their rates of on-task behavior. The entire intervention (recording, editing, and video review) was carried out on an iPad. He reported that the average total time needed to collect and edit the videos was 47.25 minutes per participant. He utilized the iMovie application, which costs $4.99 in the Apple Application Store. These costs are relatively minimal, given the gains the students made in on-task behavior. For example, one student's on-task rate increased from an average of 12.5% at baseline to 84.5% during the intervention phase, while a second participant's on-task behavior increased from 37% at baseline to 66.75% at intervention with the use of additional reinforcement.

Procedural Guidelines for the Intervention

Collier-Meek and colleagues (2012) outlined guidelines for the development of self-modeling videos. They highlighted the importance of bringing together a collaborative intervention team, because multiple personnel are needed to carry out the intervention successfully. The intervention also requires operational definitions, baseline data, and well defined behavioral goals, so that its effectiveness can be assessed as objectively as possible. Faithful implementation requires some planning to ensure that logistical concerns will be addressed.

Recording the video can utilize two approaches: either the student is recorded over time to try to catch him or her performing the target behavior, or the student is prompted to demonstrate the desired behavior. The latter is generally less time-consuming, but may involve more logistical concerns that need to be addressed, such as finding time to make the video without interrupting the student's core instruction

(Collier-Meek et al., 2012).

Video Content: Who to Include

Also worth consideration is the question of whether to include peers and adults in the video. Collier-Meek and colleagues (2012) note that this can be particularly helpful in the creation of feed-forward videos, as it can be difficult to elicit the new behavior from the target student at the time of filming. King (2012) explored the use of peer- and self-modeling videos to increase rates of on-task behavior with four elementary-aged children, two of whom had been diagnosed with ADHD. He included peers and teachers in the modeling videos, creating a more realistic portrayal of the classroom setting. The videos were created from scripted scenarios, with peers providing distractions such as nudging the participant or getting up to sharpen a pencil. This presented an opportunity for the participants to model on-task behavior that was maintained by ignoring disturbances that could be anticipated as part of regular classroom routines. The teacher acted naturalistically, walking past the students occasionally and providing praise when the participants remained on-task in spite of distractions.

Collier-Meek and colleagues (2012) also outlined recommendations for editing the video. Two guidelines are critical to the success of the intervention: including only specific content and keeping the video at a reasonable length. Any behavior that is incompatible with the target behavior should be removed during editing in order to ensure that the student observes his or her own optimal performance. The final video is typically between two and five minutes in length (Dowrick, 1999; Hitchcock et al., 2003), which should be enough time to display the student performing the target behavior without losing his or her interest and attention (Collier-Meek et al., 2012).

Video Content: What to Include

As stated, the basis of VSM is the student's review of a video that features him or her demonstrating an optimal performance of the target behavior, with the options of showing only the student or adding other members of the classroom community (Buggey & Ogle, 2011; Collier-Meek et al., 2012; King, 2012; King et al., 2014). However, there are additional considerations when creating a self-modeling video. One that varies across studies is whether to include reinforcement in the video (i.e., during filming, the teacher says "great job staying focused" after the student ignores a scripted distraction). King (2012) chose to build reinforcement into the videos so that the participants witnessed themselves or their peers receiving verbal praise for demonstrating the target behavior. Conversely, Babcock (2013) gathered footage without using scripts and attempted to remove clips that showed the student receiving reinforcement for good behavior. However, the author added captions and recorded narrations for the videos with phrases such as, "Here, you are doing a great job working on math problems" (Babcock, 2013, p. 8). This may have confounded the effort to remove reinforcement, as statements like these could be considered "praise," and were paired directly with observation of the desired behavior.

There is logic to either approach. Babcock's (2013) idea of attempting to eliminate reinforcement from modeling videos may provide a more naturalistic depiction of some classroom experiences. Kalis, Vannest, and Parker (2007) suggested that specific praise is not a common or habitual practice in a typical classroom. Dufrene, Lestremau, and Zoder-Martell (2014) examined the use of praise in alternative school classrooms. Students were placed in these classrooms due to longstanding disruptive or dangerous behaviors exhibited in typical settings. Even in a setting specialized for behavior problems, the authors found low rates of praise used during the baseline phase. Dufrene and colleagues (2014) also noted that efforts to increase teachers' use of praise, especially behavior-specific praise, have yielded mixed results. Regardless of rate of implementation for verbal reinforcement in the classroom or the challenges involved in increasing it, positive, immediate, and behavior-specific verbal feedback from teachers has proven to be an effective intervention for managing various disruptive behaviors (Dufrene et al., 2014; Moffat, 2011).

The discussion of praise is crucial to a VSM intervention because praise can serve as a naturalistic and highly rewarding reinforcer for students' efforts. Praise can provide reinforcement for good behavior with minimal cost of time and no monetary cost. It can also enhance student and teacher relationships and promote student self-efficacy (Lampi, Fenty, & Beaunae, 2005; Moffat, 2011). The argument in favor of including praise in a modeling video is based on social learning theory. Bandura, Ross, and Ross (1963) elaborated on the idea of vicarious reinforcement, where an individual observes another performing a behavior and receiving reinforcement for it. Bandura and colleagues (1963) noted that, "...the amount of learning exhibited by the observer can, in fact, be as great as that shown by the reinforced performer" (p. 601). This suggests that a student watching a video in which he or she is reinforced for executing an optimal behavior would support the learning of that behavior and increase the likelihood of its occurrence in the future. Arguably, the absence of praise in a child's classroom is not enough reason to limit its presence in the intervention. The application of praise with students with TBIs is also important to consider. Because verbal reinforcement can promote intrinsic motivation (Cameron & Pierce, 1994) and promote self-efficacy (Lampi et al., 2005; Moffat, 2011), its effects should be examined with students showing anergia and low self-efficacy related to TBI.

Consultation and Individualization

No student exists in a vacuum, which is why consultation and team cooperation are two major themes throughout the intervention literature (Bellini & McConnell, 2010; Collier-Meek, 2012; Lampi et al., 2005). Maintaining fidelity of intervention implementation can be very challenging, so providing resources, training, support, and consultation to teachers is vital to intervention success (Lampi et al., 2005; Moffat, 2011). Some authors suggest that the 4-stage approach shared by both the behavioral and direct behavioral consultation techniques may provide an effective avenue for increasing adherence to intervention protocols (Coffee & Kratochwill, 2013; Dufrene et al. 2014; Kratochwill, Bergan, Sheridan, & Elliot, 1998). Kratochwill and Bergan (1978) outlined a 4-step model of behavioral consultation: a) problem identification, b) problem analysis, c) intervention, and d) problem evaluation. In the first phase, a problem is identified, often through interview with the consultee and it is defined in the context of "elimination of discrepancies between observed and expected levels of performance" (Kratochwill & Bergan, 1978). Problem analysis requires the evaluation of baseline data to validate the problem and evaluate possible contributing factors. In this stage, the consultee and consultant also develop a specific plan to solve the problem, based on the experimental analysis of the behavior. The third phase, intervention, involves implementation of the aforementioned plan and the collection of data to provide an indication of the plan's effectiveness. The final stage, problem evaluation, involves the comparison of baseline and intervention data in order to determine the impact of the intervention. Often, further problem analysis is needed to modify the program or increase its effective implementation. This phase also provides the opportunity to discuss and establish new goals within the program and evaluate whether the student demonstrates a continued need for intervention (Kratochwill & Bergan, 1978).

Individual differences with students must also be taken into consideration. Many targeted interventions that utilize video modeling coordinate its implementation with other modalities. Kehle and colleagues (2011) reviewed the integrated use of VSM with mystery motivators and reinforcement for video viewing in order to treat selective mutism. King (2012) used a combination of VSM, video modeling featuring peers, and training in self-monitoring to increase rates of on-task behavior. Kahn (1990) combined self-modeling with short-term counseling to treat depression in adolescents, yielding positive results that were comparable to relaxation and cognitive-behavioral therapy conditions. Finally, Babcock (2013) began his study with only naturalistic reinforcers (i.e., teacher praise), but determined that one of the participants needed additional positive feedback for on-task behavior. In summary, VSM is a versatile intervention that can easily be paired with other treatment methods and allow for individualization based on student needs and abilities.

Timing of Video Presentation

Presenting the video to the student should involve prior planning to ensure that the student receives the proper dosage of the intervention and to provide opportunities for adjustment if needed. There is some debate regarding how often the student should review the video, and some authors suggest this should be based on the type of video being used (Bellini & McConnell, 2010; Collier-Meek et al. 2012). Bellini and McConnell (2010) reviewed the use of VSM with students with autism spectrum disorder, and recommended that feed-forward videos be reviewed once a day to promote acquisition of the new skill. The authors suggest that positive self-review videos be shown twice per week, although Collier-Meek and colleagues (2012) contend that this should be determined based on the target behavior and not the type of video alone.

Some researchers suggest that VSM interventions can be more effective when utilizing a spacing effect in presenting the videos (Hartley, Bray & Kehle, 1998; Kehle et al. 2011). This idea comes from research related to memory and learning, according to the theory that “spaced presentations yield significantly better learning than do presentations that are massed more closely together in time” (Dempster, 1989, p. 309). Dempster (1989) does note that the spacing interval has resulted in inconsistent effects in facilitating learning, and indicates that balance is likely a factor; there is the possibility that the frequency of presentation can be either too often or not often enough. Whether the learning interventions that Dempster (1989) and other authors discuss are truly analogous to behavioral interventions with regard to the spacing effect is not entirely certain. Some authors utilize this comparison, but without a clear indication that the spacing effect is truly a moderating factor in intervention success (Kehle et al. 2011).

Kehle and colleagues (2011) elaborated on the use of an augmented self-modeling intervention with "Jenny," a 9-year-old girl with selective mutism, in which the "spacing effect" was taken into account when the timing and number of viewings were determined at intervention onset. Jenny viewed her self-modeling video on five occasions over a 4-week period. The authors "assumed that the spacing of the viewing…would result in substantially more learning than one solitary viewing" (p. 100). They reported that, immediately following these sessions and at the end of the 4-week intervention period, "Jenny's speech and verbal interactions with classmates and teachers were completely normal" (Kehle et al., 2011, p. 101). While the authors employed the spacing effect, it was unclear if the study design could isolate this strategy as a major contributing factor to the intervention's success. Several other components, such as mystery motivators and peer reinforcement, were utilized as well.

King (2012) used both peer- and self-modeling videos combined with self-monitoring to increase on-task behavior. The participants viewed a total of four modeling videos during each full week of intervention, a relatively high dose of the intervention in comparison with the level used by Kehle and colleagues (2011). Babcock (2013) created two self-modeling videos for each participant and had them view the footage once during each session of the intervention phase. The videos were alternated so that the same one was not shown two sessions in a row. Both of these studies resulted in a marked improvement in on-task behavior, despite greater frequency of video review than other researchers have recommended.

Consistency of the time span between video review and observational data collection in VSM interventions for on-task behavior also appears to vary in the literature. Babcock (2013) conducted observations of the students immediately following intervention sessions that included video review. However, follow-up data from Babcock's (2013) study and from King and colleagues (2014) suggest a positive impact for intervention models that utilize a higher frequency of video review. Both studies saw relatively good maintenance of positive effects after the intervention had been withdrawn. Due to attrition, Babcock (2013) was only able to present follow-up data for one participant, whose prorated rate of on-task behavior was 100% during an interrupted session. King and colleagues (2012) reported three of their four participants as having maintained gains in on-task behavior at follow-up, so that they were performing at the same level, if not better, than comparison peers in their respective classrooms.

Video Self-Modeling and Traumatic Brain Injury

VSM presents a logical possibility for intervention with individuals with TBI. As mentioned, reviewing a video of behaviors and processes needed to complete a task can support short-term encoding (Buggey & Ogle, 2011; Dowrick & Jesdale, 1991), which is often one of the executive functions affected by TBI (Deutsch Lezak et al., 2012). Babcock (2013) added that video self-modeling can bolster interest and promote greater attention to the intervention, which provides a reasonable layer of support for students with executive function deficits. Numerous searches with a variety of terms and minimal filters have identified only two studies, which used video modeling with adults with TBI to support the acquisition and increase of adaptive skills.

Nikopoulos, Nikopoulou-Smyrni, and Konstantopoulos (2013) tested VSM with an adult with a TBI in an effort to treat Broca's dysphasia using a single-subject AB design. The participant, "John," was a 34-year-old male with several diagnoses due to an assault, including brain injury, bacterial encephalitis, right hemiplegia, and abdominal injury. He presented with short-term memory impairment and limited independence in activities of daily living. He was generally able to understand spoken language, but had difficulties with understanding complex language sequences (i.e., following instructions) and with expressive language. These problems with communication were due in large part to damage in the lower area of the premotor cortex, impeding the motoric functions necessary for speech production. At the time of recruitment, John had been receiving standard rehabilitation services in an inpatient setting for approximately 4 months. He was provided with individual speech and language therapy, but rarely attended sessions in the month leading up to the intervention, as he showed signs of severe motivation loss, as well as high rates of noncompliance with all therapists on his rehabilitation team.

The authors placed a 17-inch television in John's room and provided a video of an unfamiliar adult saying training words at a typical pace without exaggerated lip movements. John selected training words, starting with days of the week and months of the year. The list was then expanded with 57 additional words that began with the same syllables as those from the first list (i.e., "monk" or "money" corresponding with "Monday"). The first set of training words (i.e., days and months) were presented in print, as well as textually in the video, with each word appearing after the model had pronounced it. When John repeated words from the first list with 80% accuracy, his speech was assessed in the absence of the video. Following successful performance in these circumstances, he began working on generalizing to the other 57 words. The intervention was implemented for 14 nonconsecutive days, with each session lasting 10 to 15 minutes.

The results suggested that the video modeling was needed to continue supporting accurate speech production. For words that were modeled, he was able to achieve up to 100% accuracy with continued use of the modeling video. When it was withdrawn, John's performance deteriorated and, overall, he displayed slow generalization to words that had not been displayed in the video. At follow-up, John was able to achieve successful responding within fewer intervention sessions than initial training, suggesting a training effect that could be maintained over time. The authors note that more research in the use of video modeling with individuals with TBI is needed because it may prove to be a promising rehabilitative strategy.

McGraw-Hunter, Faw, and Davis (2006) also explored video modeling and verbal feedback with TBI, using VSM to teach cooking skills. The study used a multiple probe, concurrent baseline design where each participant underwent an initial baseline period, creation of the video, a second baseline period, and training and posttest trials with maintenance and generalization assessments (p. 1063). The study applied VSM with four participants (three males and one female), all of whom had demonstrated the ability to perform simple independent meal preparations (e.g., preparing cereal or making a sandwich), but not skills related to stovetop or oven cooking.

After the first baseline data were collected, the participants were videotaped performing each step of stovetop rice preparation under the direction of the researcher. The participants were instructed to state each step as it was performed (e.g., "I need to get out the measuring cup" as he or she got out a measuring cup). Incorrect steps, as well as statements from the researcher, were then edited out of the footage to create a video that was 2 to 5 minutes in length. At the beginning of each intervention session, the participants were told it was time to cook rice and they sat down in front of a laptop computer. They were directed to watch and listen to their individual video and were prompted to attend to the video if they became distracted. After viewing the video, they received praise and were directed to the kitchen and asked to prepare rice. Participants did not receive prompts unless they stopped responding or made an error, but praise was given for any step that was performed successfully (regardless of whether it was preceded by a prompt from the researcher).

If a participant plateaued, defined as having three consecutive training sessions without improvement, the self-modeling video was customized to address the areas that were causing consistent difficulty. If a participant continued to show a lack of improvement, a written task analysis for the cooking procedure was provided. After the participants met the training criterion (100% independent accuracy) for three consecutive sessions, they entered the posttest phase. One to 3 days later, they were asked to complete the stovetop food preparation task under baseline conditions, without viewing the video and without feedback. Additional follow-up data were collected 2 and 4 weeks after posttesting. Additionally, generalization probe data were collected during the first baseline phase, posttest trials, and immediately after the 2-week maintenance test. The generalization task involved the preparation of stovetop noodles, which was similar to the rice preparation but with slightly varied steps and different cooking times. Generalization tests were conducted under the same conditions as baseline tests.

Overall, the results suggested a consistent treatment effect, with three of the four participants meeting criterion. The participant who did not reach criterion received the three intervention phases of the study (i.e., self-modeling video, specialized self-modeling video, and printed task analysis) before requesting termination of his participation in the study. The three participants who reached criterion did so within four intervention sessions, with two maintaining at least 95% accuracy at both follow-up points. All three performed the steps of the generalization tests with 92-100% independent accuracy.

McGraw-Hunter and colleagues (2006) stated the following with regard to their study and the use of VSM with individuals with TBI:

> These results are consistent with the results of previous video self-modeling studies (Hitchcock, Dowrick & Prater, 2003; Meharg & Woltersdorf, 1990; Lasater & Brady, 1995), which suggests that video self-modeling is an appropriate method to teach skills to persons with disabilities including those with TBIs who commonly experience difficulties with attention, motivation and remaining on task. The results are compatible with Bandura's (1977) theory that learners will pay the most attention to models with whom they identify. In the case of video self-modeling, there is no higher level of learner identification. (p. 1066)

The verbal feedback element of this study should be noted, as it aligns with recommendations that training and supports be in place for interventions with individuals with TBIs (Tate, 1997). Schlund and Pace (2000) note that sensitivity to reinforcement may vary between individuals with TBIs more than it does in the general population. They also suggest that this reduction of sensitivity should be conceptualized as a behavioral mechanism rather than a cognitive one, supporting the further exploration of operant methods in TBI intervention research. These findings and the work of McGraw-Hunter and colleagues (2006) support the consideration of a reinforcement component when implementing VSM with individuals with TBIs. Furthermore, meta-analysis suggests that verbal rewards tend to produce increases in intrinsic motivation (Cameron

& Pierce, 1994), making them worthy of consideration in TBI intervention research (McGraw-Hunter et al., 2006).

Classroom Applications

With support for video and video-self modeling as tools for increasing on-task behavior (Babcock, 2013; King, 2010; King et al., 2014), it is reasonable to investigate the intervention's effectiveness in targeting this behavior with students with TBI. However, the frequency of executive function deficits following TBI suggests a need for targeting multiple behaviors in such an intervention. Due to problems related to task- and self-monitoring and initiation, these students are at risk for giving the appearance of being on-task while actually being disengaged, as well as displaying more obvious signs of being off-task (Deutsch Lezak et al., 2012; Weitman, 2006). The variability between these students necessitates the teaching of behaviors that are incompatible with either manifestation of off-task behavior.

Ducharme and Shector (2011) outlined their "keystone" approach to classroom management strategies that promote student engagement, two critical elements of which are on-task behavior and communication. They note that on-task behavior is an important prerequisite to classroom performance and academic achievement because disengagement from and inattention to a task do not facilitate its completion. Communication plays an important role as well, as these skills allow "students to access positive attention, convey their feelings, obtain assistance, play cooperatively and perform any number of other important interactional undertakings" (Ducharme & Shecter, 2011, p. 262). In applying these ideas to executive function deficits associated with TBI, it follows that interventions teaching on-task behavior and facilitation of communication could help to address a number of affected functions. Teaching students with anergia to initiate communication with their teacher (e.g., asking for help or using key phrases like "I don't understand") and then reinforcing that behavior would ideally support the student's ability to "[persist] in the face of difficulty" (Ponitz et al., 2009, p. 104) and increase overall engagement.

Schlund and Pace (2000) recommend the further exploration of behavioral strategies to intervene with problems related to TBI. One possible strategy is behavior skills training, which can be used to teach behaviors that are incompatible with behaviors such as off-task activities and staying quiet when help is needed, which need to be reduced (Dwyer et al., 2012; Travis & Sturmey, 2013). Behavioral skills training is a well-established intervention, defined as a method for teaching new skills that is composed of four components: instruction, modeling, rehearsal and feedback (Ward-Horner & Sturmey, 2012, p. 75).

This model of behavioral skills training pairs well with VSM because the video can provide continued modeling and cognitive rehearsal (Corbett & Abdullah, 2005) after initial training sessions have been completed. McGraw-Hunter and colleagues used a form of behavioral skills training in their intervention to teach cooking skills to adults with TBIs. They created a task analysis of the cooking procedure and provided the participants with instruction as the video footage was recorded. The participants served as their own models by reviewing the videos, rehearsing throughout the intervention phase, and receiving feedback in the form of positive verbalizations from researchers when they performed the steps accurately. King (2012) utilized a similar model to teach participants how to use self-monitoring materials effectively. Prior to the intervention phase of the study, participants received individual instruction in the procedures for retrieving and returning self-monitoring materials and how to use them. They then viewed a peer-modeling video demonstrating the proper use of the materials, demonstrated the process themselves and were rated on a checklist.

Purpose of the Study

Effective research-based interventions for students with ABIs are very limited (Kehle et al., 1997), despite evidence that roughly 2% of the population in the United States is living with a disability caused by TBI (Morrison, 2010). With the CDC (2010) reporting nearly 475,000 pediatric cases of TBI in emergency rooms annually, schools need to be prepared to reintegrate and support these students. Executive function deficits are among the most common problems associated with brain injury (Morrison, 2010) and can have significant impact on school functioning (Hawley, 2005). Video modeling and behavioral skills training have been shown to be effective interventions for off-task behavior for students with ADHD (King, 2012; King et al., 2014), a disorder that also involves problems of executive function. VSM has also had promising outcomes for teaching adaptive skills to individuals with ABI (McGraw-Hunter et al., 2006; Nikopoulos et al., 2013). Some of these studies have used forms of behavioral skills training in concert with video modeling or VSM in order to increase adaptive and/or productive behaviors, and have documented positive outcomes for participants (King, 2012; McGraw-Hunter et al., 2006).

The purpose of this study is to evaluate the effectiveness and acceptability of a combined VSM and behavioral skills training intervention to increase behavioral engagement with elementary-aged students who have documented history of ABI. Additionally, teachers have a wide range of demands placed on them (Walker, 2004), necessitating interventions that are as efficient and streamlined as possible (Elliot, 1998). To support this need, the filming, editing, and review of the self-modeling videos took place on a designated iPad assigned to each participant.

Research Hypotheses

1. Students with ABI will show improved behavioral engagement in a classroom setting, as demonstrated by increased rates of on-task behavior and productive initiatory behavior.
2. Students with ABI will show rates of behavioral engagement at follow-up that are similar to those at the end of the intervention data collection period.
3. Rates of teacher praise of target students' successful performance of productive initiation and being on-task during the intervention phase will be substantially higher than rates observed at baseline due to increased awareness of student behaviors and need for positive reinforcement.
4. Rates of teacher praise of target students' successful performance of productive initiation and being on-task at follow-up will be higher than rates observed at baseline.
5. Teacher ratings on the Social Skills Improvement System Rating Scales (SSIS-RS) will result in improved scores on the Top 10 Scale when comparing pre- and post-assessments.

6. All teachers will report average to above average ratings on the Usage Rating Profile—Intervention (URP-I) acceptability questionnaire.

CHAPTER 2

STUDY METHODS AND PROCEDURES

This study sought to answer the proposed research questions through intervention and data collection with parental consent and participant assent of elementary-aged students with documented histories of ABI. The Institutional Review Board and the local school district's research review committee approved the study prior to the start of recruitment. After consent and assent were obtained, baseline observations were conducted to assess pre-intervention on-task and initiation rates and identify trends contributing to off-task behavior. Participants then worked one-on-one with the author to review Unit 7 of the SSIS Intervention System, and a self-modeling video was developed and implemented with each participant.

Participants

Participants were three elementary school-aged children with ABI who were recruited through a local school district. The students ranged from kindergarten (full day) to third grade, and had injuries acquired from surgery, external force, and anoxia. Each participant was recruited with the help of his or her school psychologist, who reviewed his or her records for verification of injury prior to informing parents about the study. Parents then contacted the author directly for further information and to start the process of obtaining consent and assent. Each student had an IEP with varying levels of support, but had been placed in the general education setting for at least half of the school day. The students were spread throughout the district, so the study was conducted at three different sites. Only Participant 1 ("Bruce") was recruited early enough in the school year that follow-up data could be collected.

Participant 1: "Bruce"

Bruce was a 7-year-old male in 1st grade. He had an Individualized Education Program (IEP) under a classification of OHI, with academic support and school psychology services for coping skills and work completion and accommodations to support writing, work completion, and medical needs. His mother indicated that, at the age of five, he had been diagnosed with medulloblastoma and underwent surgery, chemotherapy, and radiation. At the start of the study, Bruce was in remission, but continued to have difficulty with fatigue that affected his energy level and vision. Following the surgery, he also experienced reduced fine motor function, had to learn to write with his nondominant left hand, and continued to experience related fatigue and frustration. Because his cognitive and motor function were slowed, he had difficulty with work completion and keeping pace with his classmates.

Participant 2: "Peter"

Peter was a 5-year-old male in full-day kindergarten at a Title 1 elementary school. Per parent report, he had a traumatic brain injury resulting from external force prior to 1 year of age. He had an IEP under a TBI classification, with placement in the special education classroom for half of his school day with support in all academic areas, as well as school psychology services to support self-regulation and a formal behavior plan. His parents and teachers noted that he was generally on grade level academically, but needed substantial behavioral support due to significant defiance and aggression. A complete copy of Peter's behavior plan was provided by his school team, and observers reviewed it and carried a copy with them to his observations. The plan utilized precision commands with a token economy to reinforce following directions, paired with a recess time response cost for noncompliance. Peter was observed primarily during math and reading instruction in both the general and special education settings. His general education teacher had been trained in the behavior plan by the school psychologist and the author encouraged its use when orienting the teacher to the study. It was noted that his behavior plan was used frequently in the special education setting, but was not implemented in his general education classroom during any observations. Peter's general education class included several other high-need students with behavior problems, so he reviewed his self-modeling video in the special education classroom to ensure privacy and a calm viewing environment.

Participant 3: "Jean"

Jean was a 9-year-old in 3rd grade, and was the only female participant in the study. She had an anoxic injury that had resulted from birth trauma, and her mother reported associated developmental delays. She had an IEP under an OHI classification, providing speech and school psychology services for social skills, and was reportedly on grade level academically. Her mother and her teacher identified on-task behavior as one of their greatest concerns, as Jean had difficulty sustaining attention and ignoring distractions within the classroom. Jean was the last subject recruited, and some of her participation coincided with the end of the school year, resulting in more frequent disruptions to the classroom routine.

Setting

The study was conducted in three elementary schools in a suburban school district in the Intermountain West. All were regular education public schools which offered pull out special education services in reading, writing, and math, as well as having a half- or full-time school psychologist and speech pathologist. One of the three schools qualified to receive Title 1 funding, and all housed students in kindergarten through 6th grade, with one also providing preschool. Two of the three schools followed a traditional year, while the third followed a year-round schedule. Observation schedules were created during the baseline phase for each participant, and observers conducted their activities 4 to 5 days per week at roughly the same times (i.e., corresponding with the classroom schedule, which changed minimally from day to day).

Design

Due to the nature of the target population, the intervention and need for data collection, the study employed a single-subject research design (O'Neill, McDonnell, Billingsley, & Jenson, 2011). O'Neill and colleagues (2011) suggest that single-case research methods can allow for the investigation and demonstration of "causal and functional relationships between independent and dependent variables" (p. 1). The authors note that single-case research focuses significantly on graphic analysis to determine the effectiveness of an intervention. One important question in such an analysis is whether the graphed data demonstrate a trend or slope that would suggest a change in the dependent variable; whether it shows a positive or negative impact depends on the nature of the variables themselves. Another important consideration is level of performance, defined as the "mean performance within a phase" (O'Neill et al., 2011, p. 56). Additionally, the level of variability within a phase should be considered in order to assess for consistency of response to the intervention. Researchers can then use these pieces of information to consider the data across phases, examining variability across phases as well as the immediacy of effect, or "how quickly changes are apparent from the end of one phase and the beginning of another" (O'Neill et al., 2011, p. 59).

This study employed a multiple probe nonconcurrent baseline design. Multiple baseline designs do not require a return to baseline. The intervention is introduced across time and can be implemented with different individuals in varying settings. The replication of effects across different conditions helps to verify a functional relationship between a behavior and an intervention (O'Neill et al., 2011). Winn, Skinner, Allin and Hawkins (2008) point out that multiple baseline designs allow for the evaluation of an intervention's effectiveness when the target behavior is not appropriate for withdrawal designs (e.g., the behavior cannot be unlearned) and they help to control for threats to internal validity. They note that multiple baseline designs can permit assessment of potential history effects and that "staggering the implementation of treatments across time helps rule out history effects via the principle of successive coincidences" (Winn et al., 2008, p. 112). Staggering intervention implementation provides further support for internal validity in its ability to protect against threats associated with assessment procedures.

Winn and colleagues (2008) argue that the nonconcurrent multiple baseline is especially well-suited for use in schools. This is because this design permits for the staggered implementation of an intervention across students, making it ideal for application with referrals that are received at different times with multiple students in separate classrooms. Winn and colleagues (2008) indicated that “demonstrations of experimental control do not require that the cases be conducted concurrently” (p. 113). The design was ideal for this study because the author sought to evaluate an intervention with a relatively low-incidence population and each participant was located in a different school. The design allowed for the evaluation of this intervention in a context where continuous data collection was unrealistic.

There were three distinct phases: baseline, intervention, and maintenance. Five, nine, and ten probes were conducted in order to establish multiple baselines. Following the establishment of baseline, each participant completed Unit 7 of the SSIS Intervention System with the author and the self-modeling video was created. Bruce was recruited early enough that follow-up data could also be collected after maintenance observations had ceased for two weeks. Participants 2 and 3 enrolled later in the study and the conclusion of the school year prevented the collection of follow-up data.

Dependent Variables

Systematic Direct Observations

Ratings on the Behavior Rating Inventory of Executive Function (BRIEF) and SSIS-RS were obtained from participants' parents and teachers. In addition, the author and a trained school psychology graduate student conducted systematic direct observations in each of the participants' classrooms (see Appendix B for observation form). Strategies to address observer reactivity were not utilized, as previous studies suggest that there is minimal difference in intervention implementation and student behavior between observer-present and observer-absent conditions (Codding, Livanis, Pace, & Vaca, 2008; Hay, Nelson, & Hay, 1980; Johnson & Bolstad, 1975). These observations consisted of 30-minute momentary time-sampling observations during consistent time periods in which core instruction was taking place (reading, writing, or math). They focused on the child's frequency of initiations and the rate of on-task behavior. A longer observation period was selected to provide sufficient opportunity for the observer to catch initiations during the class period. Observations that ended early (i.e., due to schedule changes, disciplinary problems, etc.) or included a substitute teacher were excluded to prevent a skewing of the data. The 30-minute observations were comprised of 60 intervals lasting 30 seconds. The observers used a 30-second interval timer with an audio cue in order to reduce the demands on their own attention and synchronize joint observations.

Operational Definitions for Target Behaviors

Operational definitions are an important component in establishing interobserver reliability (O'Neill et al., 2011). Hawkins and Dotson (1975) describe three primary criteria for creating an effective operational definition: objectivity, clarity, and completeness. Objectivity requires that the behavior is observable and can be recorded reliably by multiple observers. Clarity is achieved when a definition is both concise and unambiguous, providing enough information to distinguish between the target behavior and other behaviors without overly extensive explanation. Completeness translates to the use of clear guidelines for inclusion and exclusion criteria so that minimal judgment is required on the part of the individual observers.

The purpose of the study was to increase engagement in a school setting of students with traumatic brain injuries. On-task behavior is often used as a proxy for engagement, which Gill and Remedios (2012) contend is the reason that a systematic operational definition is appropriate when on-task behavior is to be measured as a dependent variable. This study utilized the definition that Ducharme and Schetor (2011) outlined: a student who is on task is "actively engaged in classroom activities that facilitate learning and not engaged in behaviors that detract from learning" (p. 266).

Because the target population has a frequent incidence of executive function deficits that can have a negative impact on initiation, it was necessary to identify an operational definition for initiation as well. The use of video self-modeling has been studied to increase social initiations of children with autism, where initiations are often defined as "unsolicited and intelligible utterances directed at a peer" (Copeland, 2007, p. 18; see also Buggey, 2005). Because this study sought to increase initiations related to classroom engagement, an altered definition was necessary. For the purposes of this study, initiation was defined as “unsolicited starting of a behavior that maintains engagement/on-task behavior or serves to meet an urgent physical/medical need.” This definition and Table 2.1 provided the foundation for training observers and ensuring consistent behavioral coding.

Some examples of initiations observed in the study included asking for help/clarification, retrieving necessary school supplies, and backing away from an aggressive peer to use calming steps. This definition allowed sufficient flexibility to meet individual participant needs, as some required medical or behavioral support to remain engaged. Simultaneously, unproductive initiations were easily distinguished and excluded so that participants were not given credit for behavior that did not encourage engagement. Some non-examples observed include following the teacher around the classroom, trying to start an argument with the teacher, and policing peer behavior.

Social Skills Improvement System-Rating Scale

The Social Skills Improvement System-Rating Scale (SSIS-RS) is a behavioral measure of social skills, with parent, teacher, and self-report forms for children between the ages of 8 and 18 years. Caregiver and teacher rating scales on the SSIS-RS permit assessment of children between the ages of 3 and 18 years. On this measure, behavior is rated in three domains: Social Skills (comprised of the scales Communication, Cooperation, Assertion, Responsibility, Empathy, Engagement, and Self-Control), Problem Behaviors (comprised of the scales Externalizing, Bullying, Hyperactivity/Inattention, Internalizing, and Autism Spectrum), and Academic

Competence (including the scales Reading Achievement, Math Achievement and Motivation to Learn). The parent and teacher ratings were used as pre- and poststudy measures to evaluate the potential effects of the intervention.

The SSIS-RS also has a Top 10 Scale, which provides item-level information regarding a child's social behaviors that aid school success. The items were rated as the highest in importance in a national sample of teachers and are used to calculate a standard score on the Top 10 Scale. The Top 10 items are as follows:

1. Asks for help from adults
2. Follows your directions
3. Pays attention to your instructions
4. Interacts well with other children
5. Takes turns in conversations
6. Acts responsibly when with others
7. Ignores classmates when they are distracting
8. Follows classroom rules
9. Shows concern for others
10. Stays calm when disagreeing with others

The internal consistency of the SSIS-RS parent and teacher forms is generally high, with alpha coefficients for the scales and subscales falling between .72 and .97 (Gresham & Elliott, 2008). Gresham and Elliott (2008) also tested interrater reliability of the measure in two separate studies where the child was rated by two teachers or two caregivers. Overall, interrater reliability of the SSIS-RS parent ratings fell in the moderate range, with adjusted r values (r^b) of each scale falling between .50 and .69. The exception to this was the Assertion subscale (r^b = .36), where interrater reliability was relatively lower. The pattern of reliability coefficients was similar in the evaluation of interrater reliability for the parent ratings, except for three outlying scaled scores, Assertion (r^b = .37), Bullying (r^b = .38), and Internalizing (r^b = .43). Because the study utilized this measure as a pre- and postintervention assessment, test-retest reliability may be one of the most critical psychometric properties. Test-retest reliability for both the teacher and parent forms was strong overall, with adjusted r values ranging from .68 to .92.

Behavior Rating Inventory of Executive Functioning

To assess problems related to initiation, each student's parent/guardian and teacher completed the Behavior Rating Inventory of Executive Function (BRIEF). The BRIEF is a well-established measure of executive function that consists of eight clinical scales: Inhibit, Shift, Emotional Control, Initiate, Working Memory, Plan/Organize, Organization of Materials, and Monitor. There are also two indexes that describe major areas of executive function. The Behavioral Regulation Index is comprised of the Inhibit, Shift, and Emotional Control subscales, while the Metacognition Index is made up of the Initiate, Working Memory, Plan/Organize, Organization of Materials, and Monitor scales. Finally, the BRIEF provides a total summary score that estimates overall executive function based on all eight clinical scales, the Global Executive Composite.

Gioia, Isquith, Guy, and Kenworthy (2000) stated that for the norming sample, the BRIEF has strong internal consistency, with α coefficients of .80 or greater on all scales and indexes for both the teacher and parent forms. The overall correlation between teacher and parent ratings was moderate ($r = .32$). Since the proposed study seeks to help TBI students increase skills related to academic success, initiation deficits observed in the classroom are of primary concern. All teachers had known the student for at least 6 months prior to completing the BRIEF, meeting the validity requirements for use of the measure. The BRIEF was used as a collateral pre- and post measure to assess possible changes in responses to initiation questions, as well as examine potential changes in other areas of executive function.

Acceptability Measure

The Usage Rating Profile—Intervention (URP-I) is a 35-item questionnaire used to assess the acceptability of a behavioral intervention. It yields four subscales that help to examine the appropriateness of an intervention in a given setting: acceptability, knowledge, feasibility, and systems support (Chafouleas, Briesch, Riley-Tillman, & McCoach, 2009). Chafouleas and colleagues (2009) elaborated on each of these areas, explaining, “treatment usage is ultimately determined by the complex interplay among a number of different factors” (p. 37). The creators evaluated the measure with school-based consultants in mind, with consideration for the unique resources and time constraints of these personnel and the professionals with whom they work. At the conclusion of the participant’s time in the study, the teachers completed the URP-I, along with the post-intervention SSIS-RS and BRIEF reports.

Materials

Observation Records

The study utilized a standardized form for observations (see Appendix B). This form is comprised of a total of 180 boxes, broken into three sections with three rows per section. The rows are designated “Pupil,” “Comparison,” and “Teacher Reaction.” This structure allowed for consistent and simultaneous coding of the participants, a peer comparison, and their teachers’ attention. The following symbols were used to codify behaviors in the study: • (a dot) for “On Task,” V for “Verbal Off Task,” M for “Motor Off Task,” and P for “Passive Off Task.” The dot symbol was selected over the traditional “T” to reduce human error in mistaking the on-task code for an off-task code in calculating the on-task rate. For teacher attention, the codes An, A-, and A+ were used for “Neutral Attention to Peer,” “Negative Attention to Peer,” and “Positive Attention to Peer,” respectively. Initiations were recorded with a tally mark above the box for the interval in which they occurred.

Sound Cues

Observers utilized an interval timer application on their personal smartphones and set it to sound every 30 seconds for a period of 30 minutes. They used this with earbud headphones to prevent students from hearing it and becoming distracted. The cue was used in individual observations to ensure accurate timing and prevent the observer’s attention from wandering. It was key in joint observations because it helped the observers stay synchronized without having to consult one another and contaminate the observation.

Video Scripts

After baseline data had been collected and participants' most common off-task behaviors were identified, a script was created for each participant to include an individualized replacement behavior (see Appendix C). For example, Bruce would often grow frustrated with falling behind the class and put his head down on his desk. His script included appropriately voicing this specific concern to his teacher and her reminding him of the associated accommodation in his IEP. Each participant had his or her own script and a copy was provided to and rehearsed with the participant, his or her general education teacher, and the peers who also appeared in the video.

iPads

A set of Apple® iPads (model 2, standard size) were purchased for the study. An iPad was assigned to each participant and all were equipped with the iMovie application. Wi-Fi access was disabled and games and applications that could be distracting were removed from the devices or hidden from view on the home screen. Each one was also equipped with a passcode that the teacher could use to lock the student into a specific application in order to prevent distractions or misuse. After rehearsing the video script, a participant's assigned iPad was used to film, edit, and finalize his or her modeling video. Editing was completed in the iMovie application by the researcher, which allowed for the removal of unusable footage (i.e., the participant looked at the camera or appeared distracted). The application also permitted adjustment of the soundtrack so that unexpected background noises could be lowered or removed without deleting the visual content. After the videos were finalized and copied to a secure storage system, the iPad was placed with its assigned participant's teacher and was only removed at the start of the maintenance phase. All iPads were equipped with a case, and all were handled with care by both the students and teachers and were returned at the end of the study without any damage or signs of wear.

Procedures

To clarify the process of the study, the following pages outline the study phases and key components. As videos were individualized to meet participants' needs, baseline data provided crucial information related to these needs. These findings and the intervention process are elaborated below.

Study Stages

The study took place in a local suburban school district in the following sequence:

1. Recruitment: Following approval from the University of Utah Institutional Review Board and the school district's research review committee, the author attended a school psychologists' in-service meeting and provided flyers to each school psychologist in the district who was assigned to an elementary school. The flyers contained information about the study, provided the author's contact information, and gave a brief description of students who may have qualified for the study. The psychologists were encouraged to provide the flyers to the parents of any students who may have been eligible to participate. Parents who were interested in having their child participate contacted the author directly to discuss questions and concerns. The author then met with parents and prospective

participants to review study procedures and obtain consent and assent. The author then approached teachers and administrators to review study procedures and obtain their consent as well.

2. Baseline data collection: Parents and teachers completed their respective forms of the BRIEF and the SSIS-RS rating scales. The author and a trained graduate student also conducted baseline momentary time-sampling observations to assess levels of on-task behavior and identify patterns of off-task behavior.
3. Teacher consultation: The author discussed the baseline observation findings with the teacher in order to further assess intervention needs. The author proposed strategies for individualizing the participant's self-modeling video and created a script for the teacher to review.
4. Intervention phase—instruction: The intervention began with implementation of Unit 7 of the SSIS Intervention Guide to provide individual behavioral skills training in initiation to each participant.
5. Intervention phase—creating the self-modeling videos: The author created an individualized script for each participant, based on observations collected during baseline and information obtained in consultation with teachers. The script was designed to include key elements to promote on-task behavior: the participant working, ignoring a distraction and receiving verbal praise for staying focused. Each participant was also featured asking for help based on his or her individual needs. For example, a participant who worked much more slowly than his peers indicated to his teacher that he needed more time and was helped accordingly. Another participant showed significant aggressive behaviors, so his video began

with the successful completion of a transition into the classroom. All requests for help were scripted to follow the guidelines of Unit 7 of the SSIS Intervention Guide.

6. Intervention phase—implementing video self-modeling: Dowrick (1999), Hitchcock and colleagues (2003), and Clark and colleagues (2000) noted gains when the video was shown an average of five times over two weeks, hypothesizing that daily viewing may result in a decrease in participant interest. Participants viewed their videos an average of twice per week: one subject completed 10 viewings over 5 weeks, another completed seven views over 4 weeks and another completed five views over 3 weeks.
7. Maintenance phase: At the start of the maintenance phase, the author removed the study's iPad from the participant's classroom and the observations continued. Participants were monitored for on-task behavior and productive initiations over the course of 1 to 2 weeks until at least five probes had been collected. At the end of each participant's maintenance phase, follow-up questionnaires (BRIEF and SSIS-RS) were also completed by the teachers and parents. The teachers also completed the Usage Rating Profile—Intervention.
8. Follow-up phase: Bruce was recruited first and was enrolled in a school with a year-round schedule. This allowed more time for participation in the study and the collection of follow-up data. After maintenance data had been collected, the observers ceased activity in his classroom for 2 weeks and then returned to observe his on-task behavior and initiation, as well as check in with his teacher. Participants 2 and 3 enlisted in the study later in the school year and were both

enrolled in schools with traditional schedules, which did not allow enough time for the collection of maintenance data.

Observations

Participants 1 and 3 were observed in only the general education setting. Peter was placed in special education services for half of his school day, eliminating opportunity for a regular 30-minute segment of core instruction solely in the regular education setting. As a result, the majority of his observations included a scheduled transition to the special education classroom, and the last 5 to 15 minutes of the observation were completed in that setting. Some observations were interrupted by school activities, participant illness, or other events. These were excluded from the data as they did not provide ample time to observe a total number of initiations that could be comparable to other data points. Comparison data from same-sex peers were also collected for on-task behavior and initiations.

Baseline Data and Replacement Behaviors

Baseline observations provided critical information for evaluating antecedents to prominent off-task behaviors for each participant. Each participant was observed a minimum of five times prior to intervention, and hypotheses for each participant's behavior patterns were discussed with one or more members of his or her school team. This information was then used to individualize his or her video scripts in order to incorporate a productive initiation that would serve as a replacement behavior for each participant's most common off-task behavior.

Bruce tended to engage in passive off-task behavior, frequently preceded by visible signs of frustration and fatigue (e.g., slumping posture, rubbing eyes, leaning head on hand, sighing heavily). His common off-task behaviors included putting his head down on his desk or staring around the classroom or at his desktop. His mother and teacher reported that Bruce experienced increased fatigue during writing, as he was continuing to acclimate to the use of his previously nondominant hand. Throughout the study, he was observed during writing and math instruction in the general education classroom. The replacement behavior that was scripted into his video was to raise his hand, request to talk to his teacher, and voice his frustration at being behind the class. His teacher provided reassurance, verbally reviewed his related accommodations, and provided verbal praise.

During baseline observations, Peter displayed instances of aggression, including tantrums and physically aggressive outbursts. His most common off-task behaviors included physical altercations with peers and hiding under or behind furniture within the classroom. Common antecedents were observed to be transitions, negative peer interactions, and hunger. These conclusions were corroborated in consultation with his school team. His baseline observations were scheduled to include instruction in both the general education and special education classrooms. However, the transition to the special education classroom often led to tantrums, and he transitioned successfully only about 22% of the time during baseline. Peter’s video was scripted to show him successfully transitioning into the classroom with his peers and following his general education teacher’s instruction to start their assignment. The script also included the participant ignoring a distracting peer (being bumped) and asking his teacher for help.

Peter was initially excited to be the “star” of the movie, but grew upset as filming progressed. The session was concluded and the footage was edited to remove the off-task behaviors (e.g., withdrawing into the corner). To prevent further distress, the school psychologist filmed Peter on a different day, successfully demonstrating his “calm-down steps” from their work together, and this footage was added to the video.

Jean was observed during math and reading instruction in the general education classroom. During baseline observations, she initiated social interactions frequently, but few of her initiations promoted behavioral engagement. She often left her seat and tried to engage peers or her teacher in conversation or tried to make physical contact. Her video was scripted to feature her ignoring multiple distractions, including a peer leaving his seat loudly and a friend repeatedly nudging her and saying “hey!” Jean also raised her hand, made eye contact with the teacher and asked her question quietly when the teacher came to her desk. The teacher answered it and then offered praise for raising her hand. Jean remained in her seat for the entirety of the video.

Intervention

Following establishment of baseline, the author conducted individual behavior skills training using Unit 7 of the *Social Skills Improvement System* (SSIS) manualized intervention (Gresham & Elliot, 2010). The SSIS-RS is based on the theory that deficiencies in social skills are based in five major areas: lack of knowledge, lack of practice, lack of cues, lack of reinforcement, and presence of competing problem behaviors. The intervention system approaches these problems with a Tell, Show, Do model. The first step, Tell, requires coaching the child to teach a specific skill. The second step, Show, includes children modeling positive and negative behavior through video clips, role play, and discussion. Finally, Do, the third phase, requires the child to review the definition, importance, and specific steps of a particular skill, followed by role playing with opportunities to give and receive feedback. Additionally, this phase allows for social problem solving by teaching the child how to define a social problem, forming a goal to solve it, and brainstorming, choosing, and implementing a solution (Gresham & Elliot, 2010, p. 13). Unit 7 teaches students to ask for help with the following behavior chain: 1. Think—think about what kind of help you need; 2. Look—look for someone who can help you; 3. Ask—Ask nicely, "can you help me please?"; and 4. Smile—smile and say "thank you" to the person who helped you (Elliot & Gresham, 2008, p. 103).

The author then created a script that was individualized to each participant's patterns of off-task behavior (e.g., included the participant tolerating a bump from a peer when reactive aggression had been observed in baseline; see Appendix C). Two peers, at least one of the same sex, were also present in the video with the participant centered between them. Each video included a request for help, followed by a response and praise from the teacher. Additionally, they featured the participant staying on-task while a peer was creating a distraction (e.g., pushing in their chair loudly, dropping something and exclaiming "oops!," or getting up to use the pencil sharpener). All videos were edited to a length of 3.5 minutes using the iMovie application on an Apple iPad2 that was provided by the study. This application allowed for the removal of any footage of off-task behavior and the adjustment of the soundtrack to create an ideal representation of the participant staying on-task and requesting help. In the case of Peter, his school psychologist provided footage in which he demonstrated the self-calming steps that he had been learning and practicing with her prior to enrolling in the study. These steps were included in the intervention, as most of Peter's off-task behavior during baseline involved temper tantrums and reactive aggression. Each participant viewed his or her video twice per week with headphones on an iPad checked out from the study. The teacher tallied each viewing on a calendar attached to the iPad.

Interobserver Agreement

O'Neill and colleagues (2011) recommend the calculation of interobserver agreement (IOA) in single subject designs because it "increases the confidence that the researcher has in the operational definition of the target behavior and ensures that the observed changes in the target behavior are due to the intervention rather than the perceptions of the individual recording data" (p. 30). Cohen's kappa was calculated using the formula presented by Uebersax (1982) that has also been utilized in other video modeling research (King, 2012; King, Radley, Jenson, Clark, & O'Neill, 2014). The formula for Cohen's kappa is $k = (Po - Pc) / (1 - Pc)$, where Po is the "proportion of agreement between observers of occurrence and nonoccurrence and Pc is the proportion of expected agreement based on chance" (King et al. 2014, p. 131).

To increase the reliability of observer data, O'Neill and colleagues (2011) recommend developing operational definitions for target behaviors and providing explicit instruction in observation and coding. Prior to collection of baseline data, the author created a training video that was used to practice joint observations and establish initial IOA. This video was created in a classroom setting with the written permission of the district, administrator, teacher, parents, and students. Two graduate students practiced observations with the author until a Cohen’s kappa of .85 was reached.

Treatment Integrity

Each participant received behavioral skills training with the author, adhering to Unit 7 of the SSIS-RS in accordance with the standards and guidelines as directed in the intervention manual. This required using the three-phase “*Tell*,” “*Show*,” and “*Do”* model of the SSIS Intervention guide to teach the four major steps of initiation: 1. Think—think about what kind of help you need; 2. Look—look for someone who can help you; 3. Ask—Ask nicely, “can you help me please?”; and 4. Smile—smile and say “thank you” to the person who helped you (Gresham & Elliot, 2010). This helped to ensure consistency of this portion of the intervention across participants. Similarly, the author created and produced each participant’s self-modeling video to ensure adherence to procedures recommended in the literature. Positive feedback from the teacher was also recorded to determine whether students were being reinforced with verbal praise for on-task behavior and initiations.

Data Analysis

Each observation yielded a total number of productive initiations, as well as the amount of time spent on task, represented as a percentage. In addition to visual analysis of trend, phase means, and variability, the efficacy of the intervention was evaluated by calculating two effect sizes (*ES*) for each participant (one for productive initiation and one for on-task behavior). These effect sizes fall under the no assumptions model, in which the difference between baseline mean and treatment mean is divided by the standard deviation of the baseline phase (Busk & Serlin, 1992). Evaluating effectiveness of interventions in single-case research has been a source of debate, and Parker and Brossart (2003) suggested that many methods used in studies with larger sample sizes were being applied inappropriately to single-case research. Parker, Vannest, Davis, and Sauber (2011) proposed the *Tau-U* statistic for single-case research as an alternative to methods traditionally used in studies with more participants. *Tau-U* combines four indices, "three of which include non-overlap with trend together: (a) A versus B phase non-overlap, (b) non-overlap and Phase B trend together, (c) non-overlap with baseline trend controlled, and (d) non-overlap and Phase B trend with baseline trend controlled" (Parker et al., 2011, p. 290). By including these factors, *Tau-U* serves as an index of trend between and within study phases. To facilitate user-friendly calculation of this somewhat complex metric, Vannest, Parker, and Gonen (2011) created an online *Tau-U* calculator that is freely available to the public and can compute *Tau-U* without the provision of participants' personal information. The software averages the data into an omnibus effect size and analyzes them for phase contrasts (Vannest, Parker, & Gonen, 2011). Minimizing the risk of human error in hand calculations, the raw observation data were entered into the *Tau-U* calculator and the aforementioned metrics were computed through the program.

Table 2.1
Productive Initiation Examples and Nonexamples

Behavior	Examples	Nonexamples
Hand-raising Putting one's hand in the air (or using appropriate equivalent) to indicate a desire to communicate with the class or teacher	Raising hand, communication card or other indicator requesting permission to speak—followed by on-task content or behavior Participating in lesson Asking for clarification Demonstrate understanding Request meeting of physical needs (i.e., drink or restroom)	"No, I was just scratching my head" Waving to a classmate during lessons Stretching Hand-raising followed by off-topic comments (e.g., "I saw a movie this weekend" in the middle of a math lesson)
Speaking Speaking up without explicit permission but remaining on-topic or serving to address an urgent need	Offer on-topic information without first raising hand (e.g., "My Mom told me about this and she said…") Clarify content of what is being taught Express frustration or lack of understanding regarding what is being taught (e.g., "I'm confused" or "I don't understand") Informing the teacher of an emergency (e.g., "My nose is bleeding!" or "I think Ben is choking!")	Off-topic talk-outs (see above) Noncompliance (e.g., "I hate this!" and putting head down) Manufactured emergencies (e.g., pretending to be ill or becoming injured due to off-task behaviors in class) Noncontributing comments (e.g., "Really?" or "Cool!")
Supply-seeking Engaging in behavior that mitigates the absence of necessary supplies for completing the task at hand	Requesting a material relevant to the lesson (e.g., pencil, computer log-in, etc.) Borrowing supplies from a peer, teacher, or shared classroom storage Leaving seat to sharpen a pencil Going to backpack to obtain relevant material	Getting/utilizing school supplies inappropriately (e.g., gets crayons out when instructions were to use a pencil or lining supplies up while passively off-task) Folding airplanes/origami outside free time Stealing or trading supplies (e.g., swapping a pencil for another pencil with a different appearance) Getting lunch/snack out of backpack at an inappropriate time
Leaving seat (without adult permission) Leaving one's seat in order to meet a relevant need that serves a physical purpose or assists in staying on-task	Running to the trash can if physically ill Getting up to sharpen a pencil during work time (as opposed to while the teacher is addressing the class) Getting his/her jacket from the coat rack (while teacher is NOT addressing the class) Getting needed supplies from backpack	Leaving the room without permission in the absence of a serious emergency Retrieving toys/food from backpack Leaving seat for nonemergency without permission while the teacher is addressing the class Roaming the room/taking extra-long route to the pencil sharpener

CHAPTER 3

RESULTS

The goal of this project was to assess the effectiveness and feasibility of a video self-modeling intervention with three elementary school students who had histories of ABI. Each student was located at a different site and, prior to starting the intervention, the author completed one individual session with each participant to review Unit 7, "Asking for Help," of the SSIS Intervention System (Elliott & Gresham, 2008). Throughout the intervention phase, participants reviewed their individualized modeling videos on an iPad assigned by the study and their teacher recorded the frequency of video access. Each student viewed their video at least twice per week and all did so with the use of headphones.

Research Hypotheses

Hypothesis 1

The first hypothesis of this study stated "students with ABI will show improved behavioral engagement in a classroom setting, as demonstrated by increased rates of on task behavior and productive initiatory behavior."

<u>On-task Behavior</u>

The baseline data collected showed a gap in average on-task rates, with participants falling nearly 20% below their same-sex peers. The average on-task rate for participants at baseline was 58.7%, compared to a peer average of 78.2%. During the intervention, the participant average was comparable to peers, with 76.8% and 74.7%, respectively. Overall, the effect appeared to maintain, as the participants averaged 72.8% on-task, with a peer average of 73.4% after the intervention was withdrawn. Participant and peer comparison averages for on-task behavior are summarized in Figure 3.1. On-task rates for each participant across the study are shown in Figure 3.2

Bruce

Bruce showed a positive trend during intervention that appeared stable across subsequent study phases. His level of on-task behavior was high through the intervention phase, with limited variability between data points. Bruce's on-task rates across baseline, intervention, and maintenance are summarized in Figure 3.3. Furthermore, he consistently outperformed his comparison peers across intervention, maintenance, and follow-up, demonstrated in examining the phase averages (see Figure 3.4).

Bruce's performance was comparable to his peers at baseline, with an average on-task rate of 74.8% and a peer comparison of 75.6%. In the intervention phase, his average rate increased by 12.8%, while his average peer comparison increased by 1%. This discrepancy was notable in the intervention phase as well, as he was on task more than his peers on 12 out of 13 observations.

Peter

Figure 3.5 shows Peter's on-task rates throughout the study. His data showed considerable variability through baseline and the first half of the intervention phase. A positive trend was noted over time, with changes that appeared to hold through the maintenance phase. His level of on-task behavior became comparable to that of his peers as the intervention progressed and the variability in his rate of on-task behavior decreased over time.

It is notable that Peter's gains were maintained in spite of a slight reduction in average on-task behavior for his male peers, as demonstrated in Figure 3.6. Peter's average on-task rate at baseline was 49%, compared to the male peer average of 79.7%. He showed a 26.2% increase with the intervention in place, and his on-task rate was comparable to his peers' average of 81.4%. He maintained this gain after the intervention was withdrawn and without a significant increase in positive attention from his teacher.

Jean

Figure 3.7 shows Jean's on-task rates across each phase of the study. She showed an increased level of on-task behavior over time, but greater variability as the study progressed. Her on-task rate trended downward during intervention, though this was less pronounced in maintenance.

Jean's overall gains between baseline and intervention were moderate, and during the intervention phase, she demonstrated an increase to an average on-task rate similar to that of her female peers. However, it should be noted that there was a high degree of variability in her data. With the intervention, her on-task behavior was comparable to her peers with an average of 71%, compared to 72.4% for female peers. She then returned to baseline levels with an average of 57% on-task during maintenance, shown in Figure 3.8.

Initiation

Figure 3.9 shows rates of initiation across the study by phase, while Figure 3.10 shows rates of initiation for each participant. Some gains in initiation were observed, but appeared to be nonsignificant overall. There was a notable discrepancy between the first two participants' and Jean's initiation rate during the intervention phase. The overall averages suggest a very slight increase in Jean's level of initiation during the intervention, that was maintained after the intervention was withdrawn.

Bruce and Peter showed notable gains in productive initiation. Bruce increased from an average of 5.6 initiations at baseline to an average of 8.6 during intervention. This increase was somewhat stable, with an average of 7.6 initiations during maintenance. Peter demonstrated a steady increase in productive initiation, starting with a baseline of 2.5, which increased to 4.6 in intervention and 6.2 during maintenance. Jean's mean productive initiations remained stable throughout the study, with averages of 2.6, 2.1, and 2.6 during baseline, intervention, and maintenance, respectively.

Behavioral Engagement: Effect Sizes

In examining TauU for each participant and overall, it is clear that the largest effects were observed with on-task behavior (see Table 3.1). The overall effect across participants was .629, indicating a moderate increase in on-task behavior. Bruce showed the most significant increase, with a large effect size of .8923. A modest effect was observed for Participants 2 and 3, with TauU values of .5273 and .5, respectively.

In contrast, the overall effect of the intervention on initiation was small, with the average TauU = .27. Consistent with visual analysis, Participants 1 and 2 showed modest increases in initiation between baseline and intervention. However, Jean displayed a slight decrease in productive initiation, demonstrated by TauU = -.14.

Hypothesis 2

The second hypothesis indicated that "students with ABI will show rates of behavioral engagement at follow-up that are similar to those at the end of the intervention data collection period." Follow-up data were only available for Bruce. Peter and Jean enrolled in the study later in the school year, leading their maintenance phases to overlap with the end of the school year. The follow-up phase had to be preceded by a two-week absence of the intervention, which was not feasible with the timelines of these participants. Bruce completed the maintenance phase and the intervention was withdrawn for 2 weeks, allowing time for follow-up data to be collected over the course of the subsequent 2 weeks, just before the end of the school year.

Bruce's increases in on-task behavior appeared to hold through maintenance and follow-up, and he outperformed his peers across every observation in both phases. His average on-task rate in maintenance was 85.2%, with a peer comparison average of 69.8%. At follow-up, this average rate held at 85.8%, with his male peers averaging 76.8%. Figure 3.11 illustrates Bruce's on-task rates across the study alongside his comparison peers. However, during follow-up, his average initiations per observation returned to levels similar to baseline, with a mean of 1.8.

Hypothesis 3

Hypothesis 3 suggested that "rates of teacher praise of target students' successful performance of productive initiation and being on-task during the intervention phase will be substantially higher than rates observed at baseline due to increased awareness of student behaviors and need for positive reinforcement." Rates of positive teacher attention to participants are summarized in Figure 3.12. Overall, a significant change in positive attention to participants was not observed between baseline and intervention. Teachers for Participants 1 and 3 showed similar rates of positive attention directed to participants, without significant increases across study stages. Peter's teacher demonstrated an increase in positive attention to Peter during the maintenance phase, but this may have been influenced by factors unrelated to the study. His school's administrator implemented a beep tape intervention with his teacher to increase her use of positive attention with students. This likely resulted in an artificial inflation of these data, showing an increase that is not related to the current intervention. Calculation of TauU confirmed the absence of significant change in rates of positive attention to participants between baseline and intervention, with TauU = .2173 overall.

Hypothesis 4

In the fourth hypothesis, it was posited that rates of teacher praise of target students' successful performance of productive initiation and being on-task at follow-up will be higher than rates observed at baseline. As mentioned, follow-up data could only be collected for Bruce due to timing of enrollment for Peter and Jean. A significant change in teacher attention during the intervention phase was not observed for any teachers in the study. Figure 3.11 displays average positive attention rates for each teacher, with averages of 2.2, 2.85, and 3.5 for Bruce's teacher in baseline, intervention, and maintenance, respectively. At follow-up, an average rate of 2.8 was observed, suggesting a very slight reduction from maintenance but also consistency with previous phases of the study.

Hypothesis 5

The fifth hypothesis suggested the following: "Teacher ratings on the Social Skills Improvement System Rating Scales (SSIS-RS) will result in improved scores on the Top 10 Scale when comparing pre- and postassessments." These ratings are summarized in Table 3.2. Peter and Jean showed gains in social skills that teachers consider critical to academic success. Both participants' teachers rated them below the average range (SS = 76; SS = 79) and both fell in the average range after undergoing the intervention. Bruce was rated within the average range before and after the intervention.

Bruce

Bruce's pre- and postparent and teacher ratings on the SSIS-RS are listed in Table 3.3. Bruce fell in the average range across both raters before and after the intervention, without notable changes in social skills and problem behaviors.

Peter

Peter's parent rating was consistent before and after the intervention (see Table 3.4), placing him below average in social skills (SS = 70; SS = 71) and indicating an above average number of problem behaviors (SS = 121 pre- and postintervention). His teacher rated him below the average range prior to the intervention (SS = 76) and within the average range after completing it (SS = 85). She also noted a decrease in problem behaviors, rating him above average prior to the intervention (SS = 123) and within the average range postintervention (SS = 109).

Jean

Jean's parent ratings showed no changes after the intervention (see Table 3.5 for a summary of Jean's SSIS-RS scores). Her teacher noted elevated behavior problems that persisted after the intervention (SS = 116; SS = 121). She did show a significant increase in social skills on her teacher's rating, moving from below average (SS = 72) to the average range (SS = 93).

Behavior Rating Inventory of Executive Function

Participant scores on the BRIEF are summarized in Table 3.6. Bruce's teacher and parent did not indicate any significant concerns with initiation across the study. Indeed, the parent ratings for all participants fell in the average range on this subscale. Peter's teacher rated him as having significant problems with initiation before and after the intervention. However, the decrease of 16 points placed Peter just above the cutoff for clinical significance (T = 65; Peter T = 66). Jean showed a reduction of four points on this subscale, falling right at the cutoff for clinical significance.

Hypothesis 6

The final hypothesis stated that "all teachers will report average to above average ratings on the Usage Rating Profile—Intervention (URP-I) acceptability questionnaire." At the end of the collection of maintenance data, each teacher completed the URP-I, the scores for which are summarized in Table 3.7. Two teachers for Peter (general education and special education) completed the URP-I, as his special education teacher ensured he watched his self-modeling video in her classroom. Three of the four teachers found the intervention acceptable and all endorsed a high degree of understanding for how to implement it. Teachers generally found implementing the intervention to be feasible and felt they could implement it if needed. However, three of the four teachers felt that a moderate degree of support and consultation would be necessary in order to set up and implement the intervention.

Interobserver Agreement

Following training in observation and coding, the author and trained observers began baseline data collection for Bruce. Over the course of the study, a total of 77 individual observations were conducted, 36% of which were completed with two observers. An overall Cohen's kappa was calculated for coding of on-task behavior with k = .92, indicating a high degree of consistency across raters.

Treatment Integrity

At the start of the intervention phase, each teacher was given a hard copy of a calendar showing the months in which the intervention would take place. The calendar was either attached to the iPad that was loaned out for the study or was placed with the teacher's other calendar items. They were asked to mark the calendar any day that the participant watched their self-modeling video, ensuring it was viewed two to three times per week. These calendars were checked regularly by observers and collected when the intervention was withdrawn at the start of the maintenance phase. They indicated that each participant watched his or her video an average of 2 times per week. Bruce watched his video a total of 10 times over the course of 4 and a half weeks, Peter a total of seven times in 3 and a half weeks, and Jean a total of five times across 2 and a half weeks

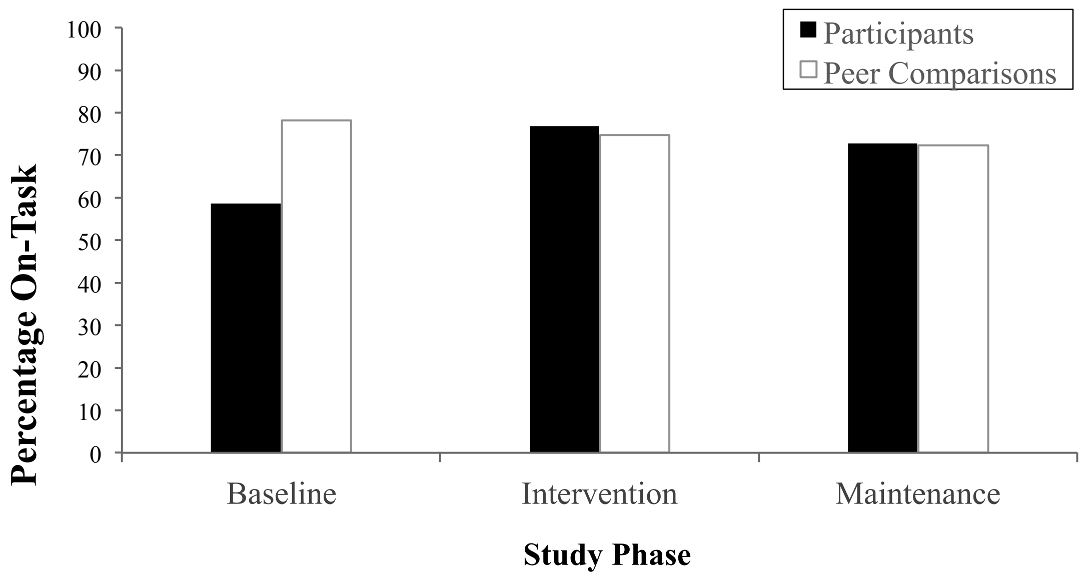

Figure 3.1. Overall on-task rates per study phase for participants and peer comparisons

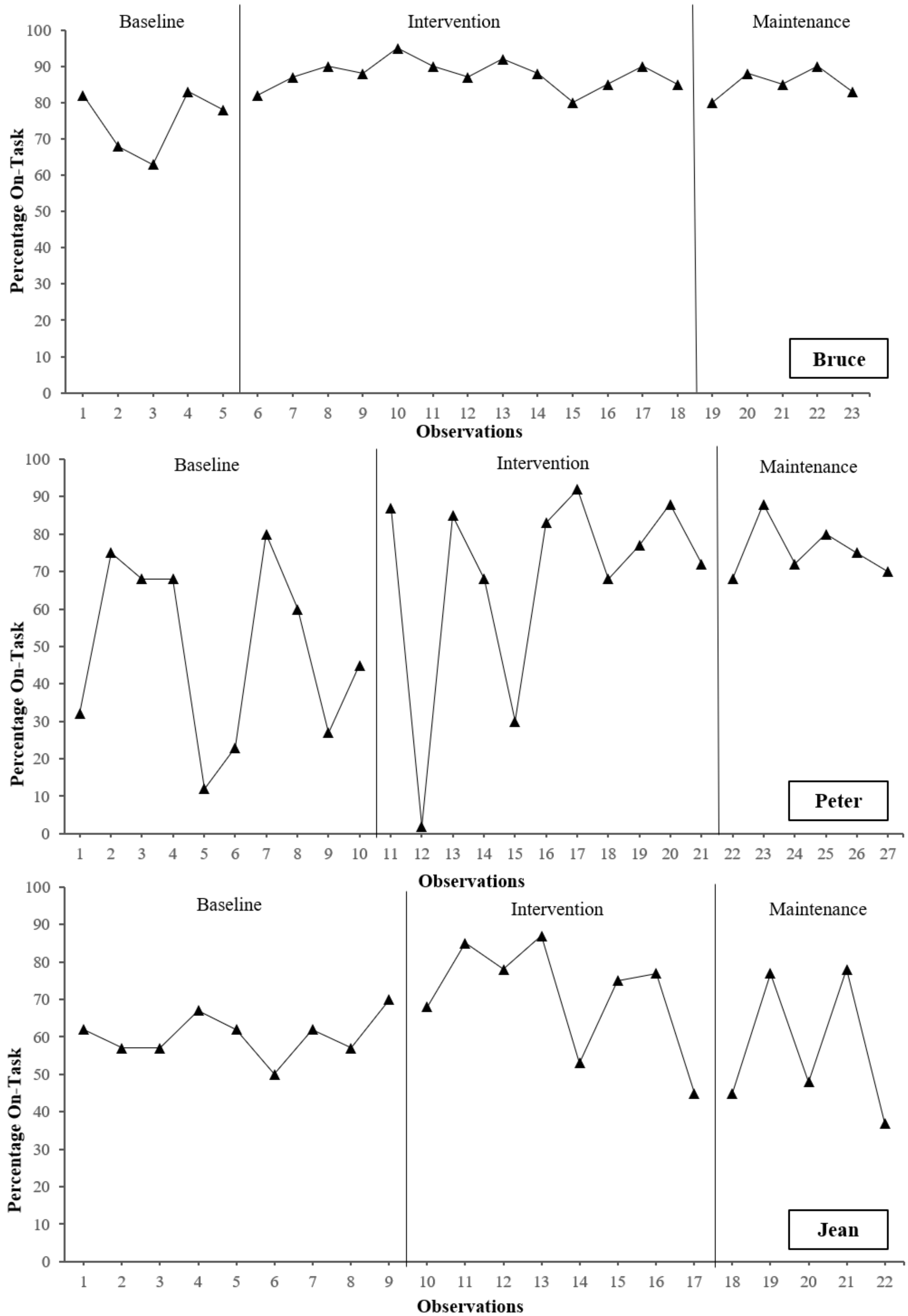

Figure 3.2. On-task rates for each observation across all participants

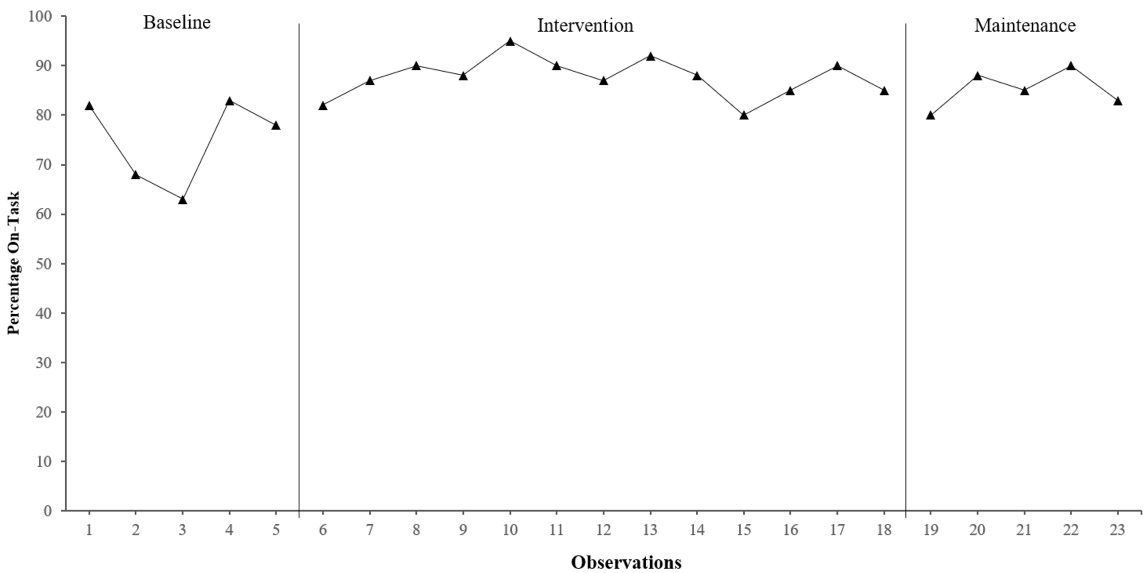

Figure 3.3. On-task rates across observations for Bruce

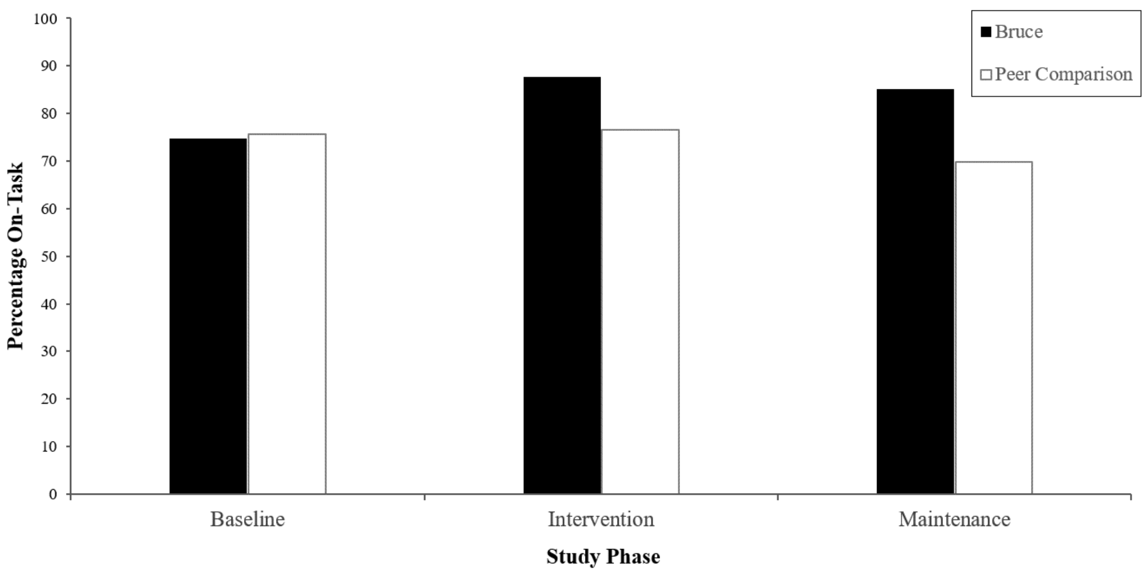

Figure 3.4. Average on-task rates for Bruce with peer comparison

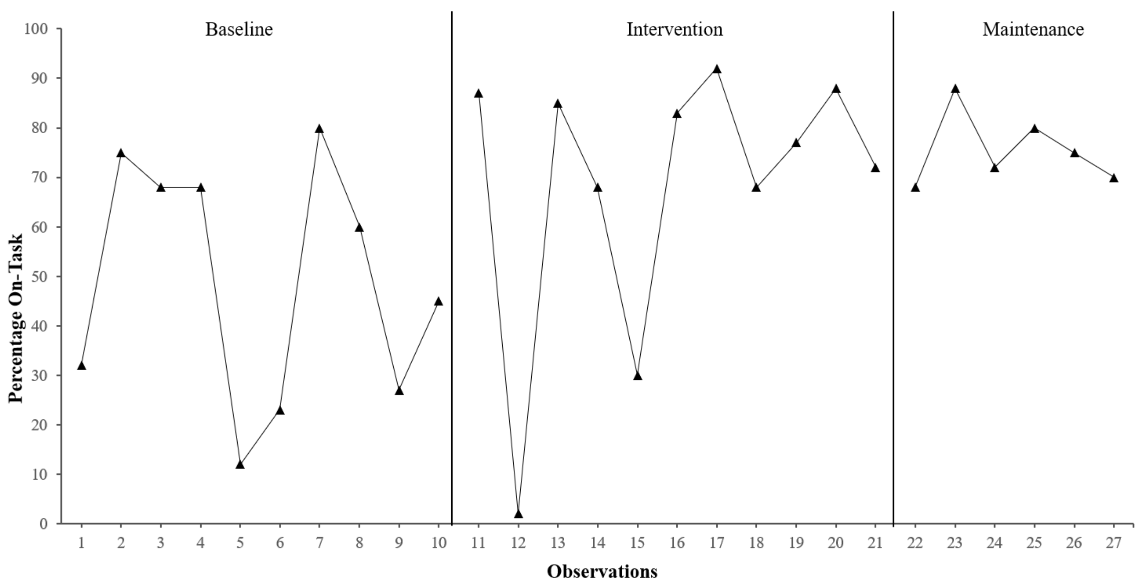

Figure 3.5. On-task rates across observations for Peter

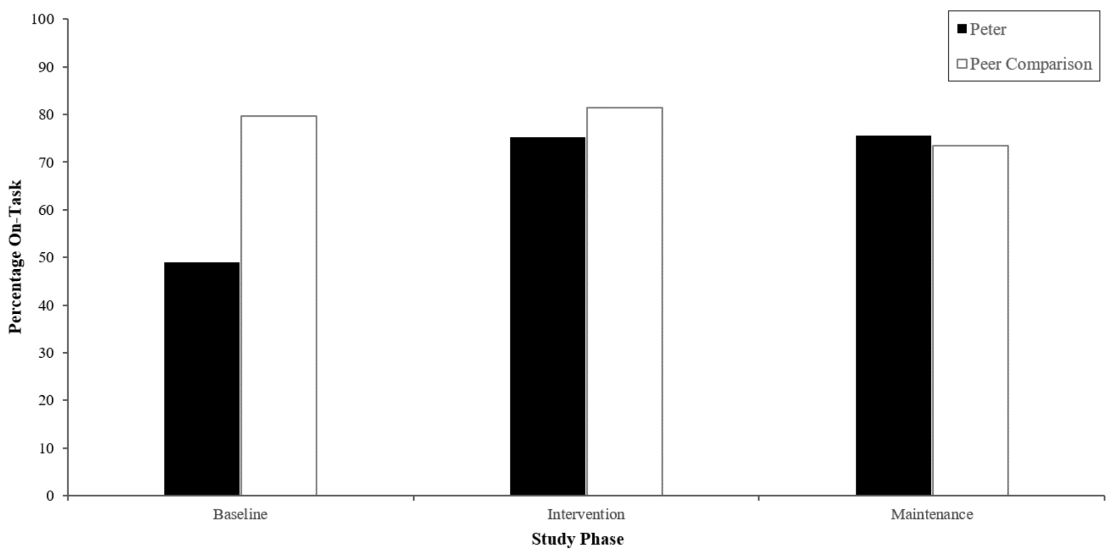

Figure 3.6. Average on-task rates for Peter with peer comparison

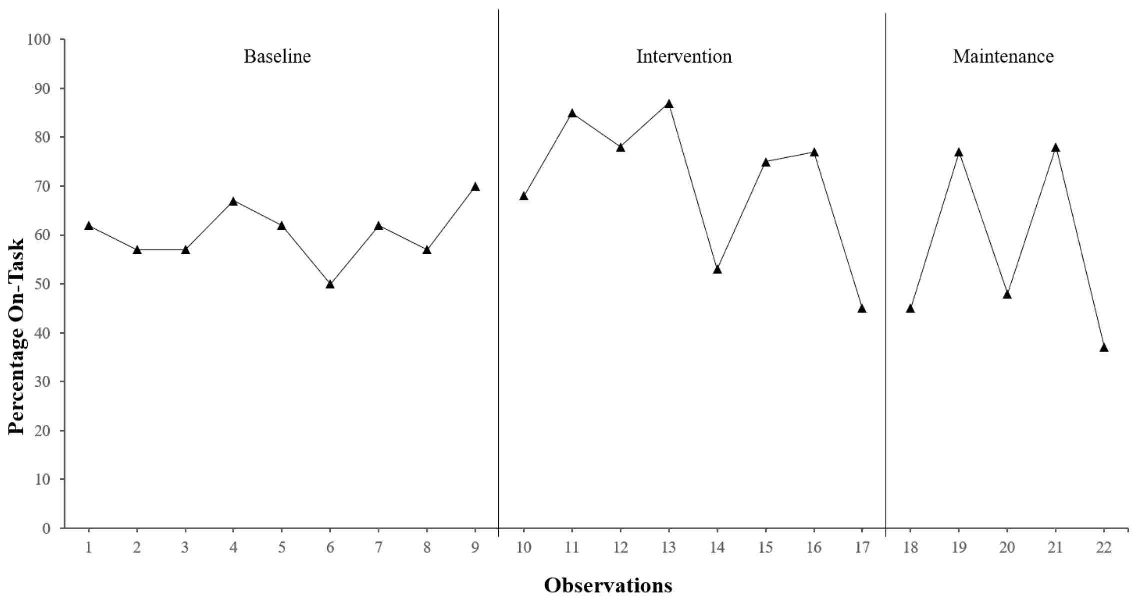

Figure 3.7. On-task rates across observations for Jean

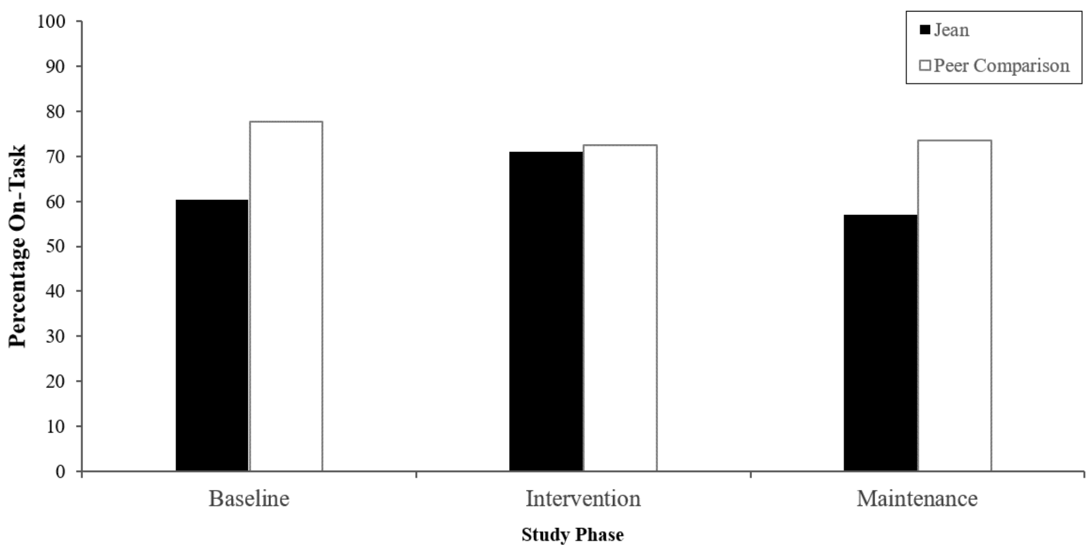

Figure 3.8. Average on-task rates for Jean with peer comparison

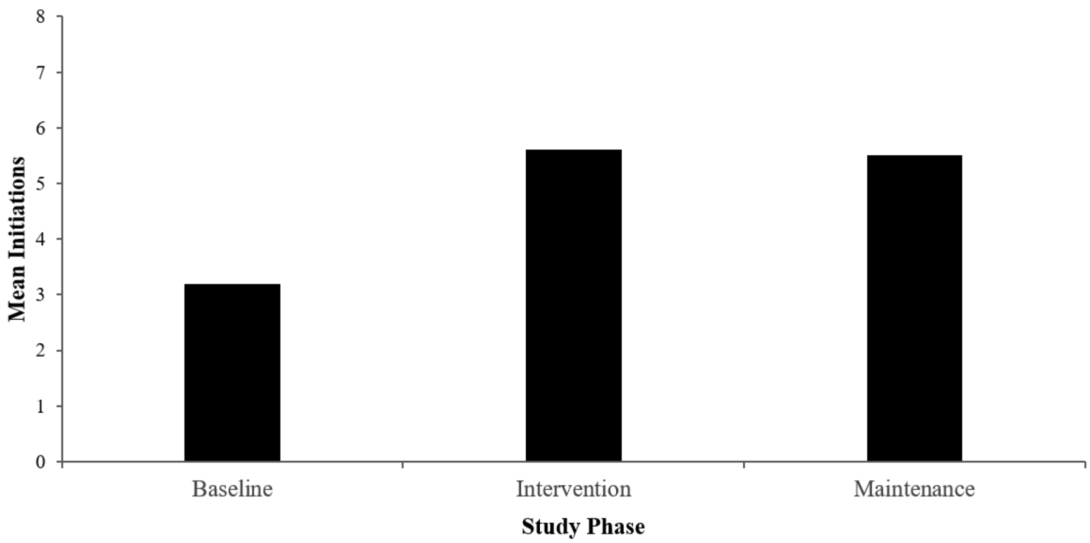

Figure 3.9. Average total initiations by phase

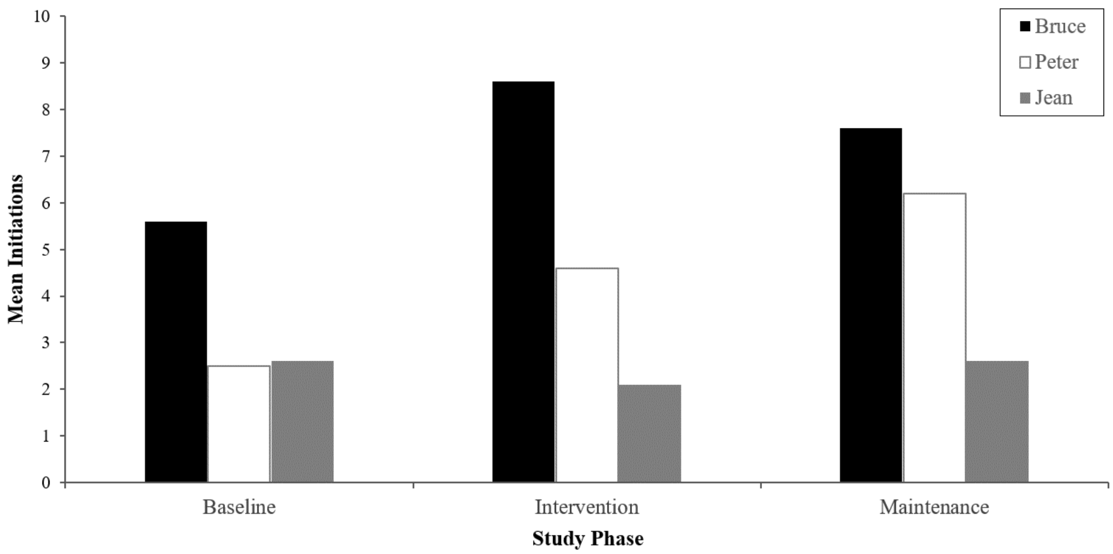

Figure 3.10. Mean initiations per participant by study phase

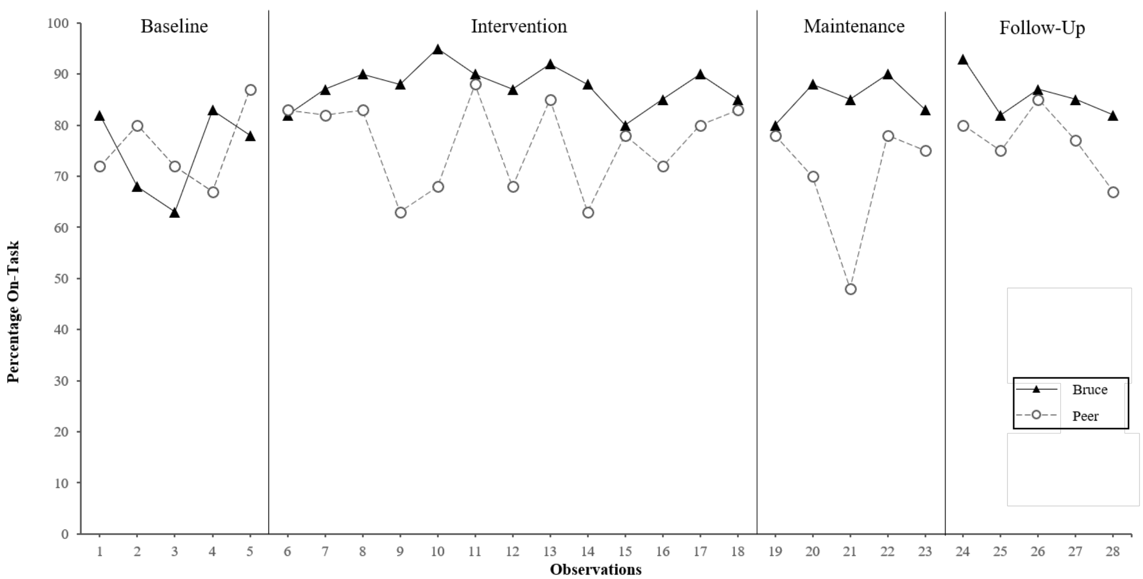

Figure 3.11. On-task rates for Bruce with peer comparison

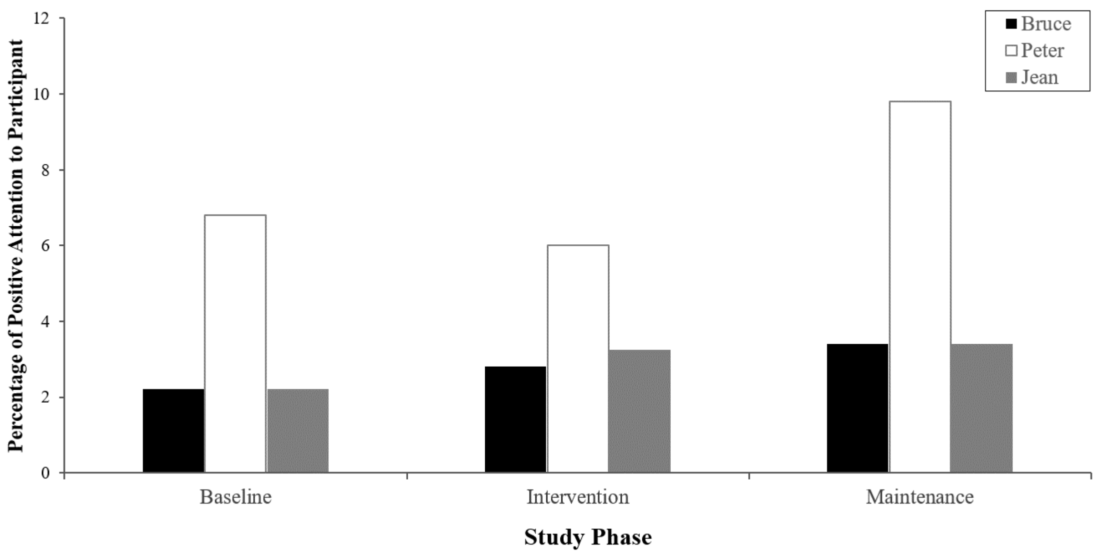

Figure 3.12. Mean instances of positive attention to participants by study phase

Table 3.1
Behavioral Engagement TauU Values

	On-Task	Initiation
Bruce	.8923	.46
Peter	.5273	.48
Jean	.5	-.14
Omnibus	.629	.27

Table 3.2
SSIS-RS Teacher Top Ten Standard Scores

Participant	Preintervention	Postintervention
Bruce	114	106
Peter	76	89
Jean	79	85

Table 3.3
Bruce: Parent and Teacher SSIS-RS Standard Scores

Scale	Teacher Pre	Teacher Post	Parent Pre	Parent Post
Social Skills	108	96	94	96
Problem Behaviors	91	93	103	92

Table 3.4

Peter: Parent and Teacher SSIS-RS Standard Scores

Scale	Teacher Pre	Teacher Post	Parent Pre	Parent Post
Social Skills	76	85	70	71
Problem Behaviors	123	109	121	121

Table 3.5

Jean: Parent and Teacher SSIS-RS Standard Scores

Scale	Teacher Pre	Teacher Post	Parent Pre	Parent Post
Social Skills	72	93	85	87
Problem Behaviors	116	121	125	125

Table 3.6
BRIEF Initiate Subscale T-scores

Participant	Teacher Pre	Teacher Post	Parent Pre	Parent Post
Bruce	57	49	58	55
Peter	82	66	46	55
Jean	69	65	52	55

Table 3.7
Teacher URP-I Scores

Participant	Percentage			
	Acceptability	Understanding	Feasibility	Systems Support
Bruce (Gen Ed)	72	88	92	61
Peter (Gen Ed)	82	81	83	56
Peter (Sped)	91	92	98	58
Jean (Gen Ed)	53	81	77	22

Note: *Lower Systems Support scores indicate that the intervention can be implemented independently with little need for support from colleagues*

CHAPTER 4

DISCUSSION

Summary and Conclusions

The current study sought to address a gap in the research for interventions with students with a history of acquired brain injury and test an established intervention with this population. Little direct guidance is offered for addressing the needs of students with brain injuries after their urgent health needs are addressed, but attention and work completion are common concerns for these students (Begyn & Castillo, 2010; Morrison, 2010). Video modeling interventions have shown promise in helping to improve these deficits in other students (Babcock, 2013; Buggey & Ogle, 2011; Buggey & Ogle, 2012; Hitchcock, Dowrick, & Prater, 2003; King, 2012; Mason et al., 2016). The study recruited three participants with histories of ABI, all through different etiologies: brain tumor, TBI, and anoxia. Videos were individualized based on baseline observations to feature specific replacement behaviors for noted off-task behaviors.

The first hypothesis was partially supported, as each of the participants in this study showed varying increases in on-task behavior, with moderate improvement overall. Conversely, a significant effect on productive initiatory behavior was not observed across participants. Two participants showed moderate increases in productive initiation, while the third demonstrated a slight reduction compared to baseline. Regarding the second hypothesis to assess the intervention effects after a 2-week withdrawal of self-modeling videos, follow-up data could only be collected with one participant. However, these data were promising, in that the intervention effect with on-task behavior appeared to hold. His productive initiatory behavior returned to levels similar to baseline data, but it should be noted that there was significant variability across follow-up observations for this variable.

Hypotheses 3 and 4 were not supported in this study, as a significant change in rates of teacher praise was not observed between baseline and intervention phases, nor was there substantial change during the maintenance phase. These results align with previous concerns and conclusions in the literature, indicating that behavior-specific praise is fairly uncommon in classroom settings (Dufrene et al., 2014; Kalis, Vannest, & Parker, 2007). Where these previous studies have suggested that efforts to increase teachers' use of praise have mixed outcomes, the results of this study suggest that consultation had a limited impact on this variable. However, this conclusion should be understood in context. All three of the teachers who participated in this study were noted by administrators as having classroom communities with unusually high levels of need for special education services and behavior management interventions. This intensity was compounded by the fact that much of the study was conducted toward the end of the school year, when routines are more frequently disrupted. It should also be noted that Peter's teacher had the highest rates of verbal praise in the study, but was often observed giving him praise and positive attention for nonpreferred behaviors, despite regular coaching against this from the school psychologist and an administrator. Additionally, teachers often expressed feeling overwhelmed with requirements for classroom management and monitoring classwide progress, likely reducing the impact of a third party's encouragement to use praise differently or more frequently. It is possible that the consultation process of the study may have had more impact on teacher behavior if conducted by an administrator, grade-level team member, or other faculty, rather than a graduate student who was not part of the educational teams for the participating students.

Despite the lack of change in rates of praise, teacher ratings did indicate that they noticed changes in student behavior. Hypothesis 5 was supported overall, as two of the three students moved from the "below average" range to the "average" range on the SSIS-RS Teacher Top 10 scale. The third participant was rated within the "average" range pre- and postintervention. Finally, Hypothesis 6 had mixed results, with three of the four teachers reporting average to above average acceptability and Jean's teacher rating it below average. All reported above average levels of understanding and feasibility, with average to below average need for support in implementation. Some notable extenuating circumstances complicated the initial intervention implementation, particularly in the case of Jean's teacher. A death in her family necessitated a delay in making Jean's video. At the rescheduled filming time, the "helper" peers were absent and additional child and parent permissions had to be obtained. An appropriate video was eventually created, but these complications increased the amount of time and energy needed from Jean's teacher. VSM is an intervention that requires an initial time investment, which can be challenging without further complicating factors, and teachers' extensive job expectations and restricted availability must be taken into account in implementing this procedure.

Study Comparisons

Video Self-Modeling

Mason and colleagues (2016) completed a single case meta-analysis of VSM for individuals with disabilities, evaluating 14 studies that examined the intervention with a total of 50 participants. The authors evaluated the effectiveness of the intervention based on participant age, disability category (autism spectrum disorder, intellectual disability, emotional/behavioral disorders, and learning disabilities), implementation protocols (feedforward and positive self-review types with or without additional components) and targeted outcomes (academic, behavior, independent, and social). The present study examined the intervention with students in different disability categories than Mason and colleagues (2016), though there was some overlap with students with emotional/behavioral disorders (EBD). This study utilized positive self-review (PSR), as each participant's video featured an optimal performance of behaviors that had already been learned and demonstrated at some level prior to the intervention. This study did not utilize additional protocols, and, under the authors' definitions, targeted a social outcome (i.e., on-task and initiation).

Compared to Davis and colleagues (2016), the present study's omnibus effect size for on-task behavior (.629) was comparable to that for elementary students (.70) and lower than was seen for students with EBD (.81). This study noted a moderate effect using PSR delivered without additional components, comparable to the authors' findings that PSR was superior to feedforward (FF) and that VSM was most effective when implemented alone. In examining targeted social outcomes, the present study's effect on on-task behavior appears slightly smaller than the authors' effect size of .76 (Davis et al., 2016).

The impact on initiation (omnibus TauU=.27) was substantially lower than would be expected, based on that same effect size for social behaviors in Mason and colleagues (2016). Much of the current research in VSM and initiatory behavior examines the intervention's effect on the social skills of children with autism (Boudreau & Harvey, 2013; Buggey & Ogle, 2012; Mason et al. 2016; Yingling Wert & Niesworth, 2003). Yingling Wert and Niesworth (2003) tested the effects of VSM on spontaneous requesting in four children, ages four and five, who had been diagnosed with autism. They saw significant improvements for all four participants, with a noted delay in one participant's response to the intervention. Buggey and Ogle (2012) and Boudreau and Harvey (2013) sought to increase initiations of social interactions with peers and both studies saw significant increases in socially initiatory behavior. The current study examined initiation under a definition that targeted improving engagement in the classroom, potentially including initiations of a social nature (e.g., asking a peer for clarification or help). While the definition used in this study is somewhat unique, the results obtained here appear inconsistent with the existing literature regarding VSM and initiation. It is unclear whether this study's observed lack of improvement in initiation is related to features of the target population, or an underlying weakness of the study itself. Moreover, the context of the initiations should be considered, as two very different initiatory behaviors could ultimately be counted and quantified with the same weight. For example, Peter showed an independent initiation of his "calm down steps" after becoming upset with a peer, and, after completing the steps, he rejoined his work group to complete the assignment. Previous observations noted similar situations in which he did not use his calming steps, leading to a substantial reduction in on-task behavior for the remainder of the observation. This instance of initiation was measured in the same way as less impactful behaviors, such as requesting to use the restroom or get a drink, even though its impact was arguably more substantial in maintaining the student's engagement.

With regard to results obtained through rating scales, the pattern observed here appears to have precedent in previous research (Spata, Carter, Johnson, & McGill, 2016). Participants' teachers reported average scores on the Teacher Top 10 scale at the conclusion of the intervention, with two of those representing improvements from ratings that were initially below average. However, these improvements did not appear to have parallels in the home environments, as parent ratings did not indicate any changes before and after the intervention. Spata and colleagues (2016) observed similar patterns with VSM, as teachers reported improvements on the Behavior Assessment System for Children, 2^{nd} Ed. (BASC-2) that were not mirrored in parent ratings. The authors theorized three reasons for this: video clips and the intervention took place in the school environment, parental tolerance and perception of behavior problems across participants may have varied, and children show different patterns of behavior in different settings (Spata et al., 2016, p. 178). These reasons may also account for the differences between parent and teacher ratings in the present study. Additionally, this study's intervention targeted a behavior (staying on-task) that can present very differently at home and school, which was modeled specifically for the classroom setting.

Classroom-Based Interventions for Students With ABI

Bruce (Brain Tumor)

Bruce's injury originated from a medulloblastoma and the associated treatment to remove the tumor and shrink the remaining cancerous tissue. He had an IEP that outlined special education services for reading, writing, and math, as well as school psychologist support for anxiety. Bruce showed moderate gains in initiation (TauU = .46), but his increase in on-task behavior (TauU = .8923) was the most robust in the study. It should also be noted that, during the intervention, maintenance, and follow-up phases, Bruce's on-task rate and number of productive initiations was higher than his peers on 22 of 23 data points for each variable. Bruce's classroom environment was marked by structure and consistency, noted by the presence of posted rules and schedules with clearly observable administration of individual and classwide positive reinforcement. Additionally, observations were conducted at roughly the same time at each data point (i.e., most occurring directly after lunch) and a similar sequence of events was observed each time. While it is likely that this consistent environment and other teacher behaviors were beneficial for Bruce, his steady outperforming of his peers suggests that the intervention had an added effect that interacted positively with classroom factors. Bruce performed better than the other two participants, which may have been due in part to having relatively higher social skills at the start of the study (based on teachers' SSIS-RS ratings). However, the fact that he consistently performed better than his same-aged male peers in the same classroom environment supports the conclusion that the intervention played a significant role in improving his on-task and initiatory behavior.

Previous research in the long-term functioning of childhood cancer survivors has noted problems in their self-esteem, confidence, processing speed, concentration, and a number of other cognitive domains (Begyn & Castillo, 2010; Cheung et al., 2014; Donnan et al., 2015; Ribi et al., 2005). After the start of the intervention, Bruce demonstrated initiatory behaviors that included requesting help or more time, as well as an increase in lesson participation and offering answers to questions from his teacher. It is possible that the intervention improved Bruce's confidence or reduced his anxiety related to participation or requesting help and accommodations. Further research into the emotional and psychosocial aspects of VSM may provide greater insight into the emotional side of intervention.

Related to processing speed and concentration deficits, it should also be noted that Bruce's performance relative to his peers may represent a "positive compensation," that, if crystallized, could have long-term academic benefits (Begyn & Castillo, 2010, p. 751). Where Bruce was generally slower to process information and complete assigned tasks, having a higher level of on-task behavior than his peers would be of benefit in helping to reduce the discrepancy in performance and work completion between him and his classmates.

Classroom interventions for disabilities that result from brain tumors and their associated treatment have not been not widely researched. The present study suggests that further investigation is strongly warranted, particularly considering the increasing survival and subsequent school reentry of this particular group of students (Begyn & Castillo, 2010; Donnan et al., 2015). Previous research has noted difficulty with follow-through for supporting children who return to school after surviving cancer (Cheung et al., 2014). Some identified barriers included variation in teaching practices and logistical problems (Cheung et al., 2014, p. 1086). Considering these factors, VSM presents an encouraging avenue of intervention for students after cancer treatment, because it has become somewhat familiar through implementation with other student populations and, after an initial time investment, tends to be less logistically demanding with access to handheld devices (Babcock, 2013; Buggey & Ogle, 2012). Bruce's teacher generally rated the intervention as having above average feasibility and acceptability, as well as being easy to understand. She did indicate that she would need a moderate level of support and consultation to implement the intervention, but it may be worth the combined efforts of an educational team if future research of VSM with this population yields similar results to this study's initial findings.

Peter (Traumatic Brain Injury)

Peter's TBI resulted from external impact to the head during infancy. He was placed in a special education classroom for half of his school day and had a formal behavior plan. His behavioral presentation was consistent with previous studies that suggested overlap of TBI and EBD (Kehle, Clark, & Jenson, 1997; Kehle et al., 1997; Max et al., 1998a; Max et al., 1998b; Taylor, 2010), as his most common off-task behaviors included aggression and noncompliance. His video was individualized to target these behaviors (D'Amato & Rothlisberg, 1997; Morrison, 2010) and he showed moderate increases in on-task behavior (TauU =. 5273) and productive initiation (TauU = .48). Furthermore, these improvements showed reduced variability in his performance from one day to the next, which was evident in the intervention and maintenance phases. Overall, however, his outcome falls below what might be expected, based on studies of

VSM for students with EBD (Losinski, Wiseman, White, & Balluch, 2016; Mason et al., 2016).

The reasons for this discrepancy in response to the intervention are not entirely self-evident, and the lack of previous research on VSM and ABI/TBI in the schools makes comparisons to other studies difficult. It is challenging to determine whether Peter's limited response to the intervention relates to the etiology of his presentation (i.e., TBI) or a number of complex environmental factors. His educational team reported that, based on individual norm-referenced testing, they did not have concerns about his cognitive ability or basic academic skills, but that his behaviors impacted his day-to-day functioning and academic progress. Peter demonstrated increased behavior problems when faced with change or transition. However, frequent changes in classroom management systems were observed, which sometimes conflicted with the procedures prescribed in his formal behavior plan (i.e., the changing combination of procedures resulted in use of response cost without any opportunity for positive reinforcement). Adherence to the behavior plan was not observed in the general education setting, though the materials had a designated location in the classroom and were referenced in his self-modeling video. Implementation of the behavior plan was observed in the special education setting regularly, and behavior assessment suggested that this inconsistency preceded many of the observed problem behaviors. It was also noted that Peter often received positive attention following noncompliant behavior, despite recommendations not to do so from multiple support personnel. The general conclusion with his educational team was that Peter often received "mixed messages" regarding what behaviors were acceptable and what positive and negative consequences might occur. Peter became upset at the initial filming for his video, but reportedly enjoyed the intervention overall. He asked his special education teacher why he could not watch his video every day and sometimes reminded her about it on scheduled viewing days. The author elaborates these concerns and observations in order to emphasize the difficulty controlling extraneous variables in this particular case and to highlight the social validity that persisted in spite of these complications. While Peter's response to the intervention was less than might be expected in comparison with previous research, his data do not eliminate VSM as a potentially viable intervention for students with TBI, and future research would do well to examine this intervention in more tightly controlled settings.

Jean (Anoxic Brain Injury)

Jean's ABI occurred at birth due to anoxia. Her IEP outlined services for speech articulation and school psychologist support for work completion and social skills. She was distracted frequently, and showed patterns of hyperactivity, frequent impulsivity, and oral sensory-seeking. Additionally, she showed instances of noncompliance that were observed to include arguing and attempted negotiation with the teacher, occasionally escalating to tantrums (i.e., crying and holding her head to her desk or the floor). Her behavioral presentation overlapped markedly with features of ADHD combined presentation, with some features of emotional and behavioral disturbance (EBD) as well. She often left her seat and quickly became distracted by her peers' activities. She asked for help from her teacher, but usually did so by calling out or leaving her seat to follow her teacher at inappropriate times.

Compared to previous research with students in these categories, Jean showed less response to the implementation of VSM (Mason et al., 2016). Her on-task behavior showed moderate improvement (TauU = 0.5), but her productive initiations decreased very slightly (TauU = -0.14). Studies of interventions implemented specifically with students with ABIs are sparse, particularly for females. One point of comparison was identified in a study conducted by Spata, Carter, Johnson, and McGill (2016), where they implemented VSM with a female student who had a history of TBI and presented with noncompliance. The authors did not utilize direct observation, but reported pre- and postintervention scores on the BASC-2 parent and teacher ratings for their subjects, which indicated a similar lack of response to the intervention based on teacher ratings. While there is some commonality between this and the current study, the significant caution remains that these results are not generalizable due to a number of study limitations, to be discussed in detail in the next section.

Features that may account for Jean's outcome include the nature of her injury and factors within the classroom environment. Research suggests that functional impairment is driven by tissue loss rather than etiology (Hopkins, Tate, & Bigler, 2005), and Jean's injury may have been more specific to areas associated with executive function, meaning that a package intervention (e.g., inclusion of self-monitoring, impulse management strategies, etc.) may have been more beneficial to address her broader range of deficits. Where the other participants showed deficits in one or two areas (e.g., sustained attention and/or emotion regulation), Jean demonstrated additional challenges with memory, severe impulsivity, and intense interests. Regarding the latter, much of her off-task behavior related to the *Harry Potter* series, as she read it at inappropriate times or tried to start discussions about it with her teacher. She also showed frequent oral sensory-seeking behavior that contributed to distractions as well. Textured chews had been provided prior to her enrollment in the study, but she continued to exhibit these behaviors frequently and her teacher voiced ongoing concern. A complex presentation such as Jean's may benefit more from a combined approach that can address more of these concerns simultaneously, such as VSM with an associated structured behavior plan to place more emphasis on replacement behaviors with frequent positive reinforcement.

A number of environmental factors should also be noted in Jean's case, with the most pertinent being the timing of her enrollment in the study. Jean's participation overlapped considerably with the end of the school year, a time that was marked by increased stress and changes in routine. Additionally, few formal behavior management strategies were observed in her classroom, limiting opportunities for concrete behavioral feedback. More outbursts were observed from Jean's peers as the study progressed, and there was a slight decline in on-task rates from peer comparisons in her classroom. As with Peter, Jean's data do not rule VSM out as a viable intervention for children with ABIs, but further research and potential modification of the intervention could be beneficial.

Conclusions

The present study showed mixed results in participants' responses to the intervention. Mason and colleagues (2016) noted a slightly reduced level of responsiveness to VSM in children with externalizing behaviors. Peter and Jean both demonstrated some of these behaviors, so this may account for some of the discrepancy between their responses and Bruce's. While every ABI is different and must be treated as such (D'Amato & Rothlisberg, 1997; Morrison, 2010), there is arguably more overlap between Peter and Jean in the etiology of their injuries (Hopkins, Tate, & Bigler, 2005). The primary difference between them and Bruce is that Bruce could remember experiences prior to the impairments caused by his ABI, while Peter and Jean both acquired their injuries in infancy. The reason that this fact might impact intervention response could only be conjecture at this point, but should be a point of consideration in designing and conducting future research. Bruce's response to the intervention may have been rehabilitative, where the other participants were trying to progress to a skill level not previously established. Additionally, a number of environmental factors may have played a role in participant outcomes. Research in classroom settings can often present potential confounds, as control over external conditions tends to be very limited. It is notable, however, that participants showed overall moderate improvement in on-task rates, despite a number of extraneous factors and a lack of increase in teacher praise. Of particular note related to the unchanging rates of praise by teachers, the self-modeling videos in this study featured the participants receiving verbal praise from their teachers for demonstrating behavioral engagement. Babcock (2013) suggested removing reinforcement from modeling videos to provide a more naturalistic depiction, as rates of teacher praise appear generally low in classroom environments. However, the data from this study tentatively suggest that effects on behavior can result with videos that depict reinforcement, even when it is infrequent in the classroom environment. Previous studies have suggested that VSM tends to be most effective as implemented here, without being packaged with a structured reinforcement system (Mason et al., 2016). The study sought to explore this intervention with a new population and a number of strengths, limitations, and suggestions for future research have been identified.

Strengths

While the current study was subject to a number of limitations and challenges that often occur in single case designs, particularly in classroom settings, these factors also present an important reality: educators often face changes and challenges, and are working to support students in a complex environment that can be difficult to predict. This study highlights the flexibility and feasibility of this intervention, because after the initial time investment to create the videos, each participant was able to remain on a consistent viewing schedule, in spite of changes in routine and classroom procedures. After baseline data were collected, videos were customized to each unique behavioral presentation and environment, following guidelines to individualize interventions for students with ABIs as much as possible (D'Amato & Rothlisberg, 1997; Morrison, 2010). The intervention was further streamlined with the use of Apple® iPads to film and edit footage, as well as implement the intervention. The study also examined this intervention with three students who each had a verified history of ABI with different etiologies, and heterogeneity, while not ideal in research, is more characteristic of a typical classroom cohort.

Previous research in VSM has examined the intervention primarily with students with autism, EBD, intellectual disability and ADHD (Mason et al., 2016), but this study sought to explore its use with a new target population. To accommodate this shift, several procedures were designed to align with previous research in VSM. Each self-modeling video was edited to 3.5 minutes in length, which falls comfortably within the range that seems to be most effective (Buggey, 2009; Dowrick, 1999; Hitchcock et al., 2003; Spata et al., 2016). Additionally, all three participants were of elementary school age, which is the most commonly researched age group for this intervention (Mason et al., 2016). Additionally, systematic direct observations were utilized here with a high degree of interrater reliability to ensure greater confidence in assessment of participants' responses to the intervention.

Limitations

The current study sought to explore an established intervention with a population that is not frequently researched in the school intervention literature. Not surprisingly, it also shows limitations in interpreting the results presented here. Recruitment was challenging, as students with ABIs are frequently not identified and were therefore difficult to recruit for the study (Hawley, 2002; Linden et al., 2013). Two potential participants were identified but did not participate. Both had documented histories of TBI, but parent and teacher consent could not be obtained. Ultimately, the study included three participants with a documented history of ABI and associated IEP services. While these inclusion criteria ensured a verified history of ABI (Spata, 2016), they further restricted eligibility for study participation in a population that, despite frequent need for additional support, has been documented as being underserved through formal services (Hawley, 2002). Because of these limitations, inclusion criteria could not be restricted further, resulting in a somewhat heterogenous sample with three different etiologies of ABI.

The present study also bears many of the common problems of single-case research. The sample size was small and the study lacked a true control group. Multiple baselines helped to ameliorate this, but challenges with recruitment and working in a "real world" classroom setting prevented the possibility of a concurrent baseline design. These complications included a teacher leaving town for a family emergency and a participant going on an unexpected family vacation, resulting in unavoidable schedule changes for the study. Additionally, one of the participants was enrolled in a year-round school, meaning that he went "off track" for multiple weeks while the other participants were still at school. The difficulty with recruitment and the study timeline also prevented collection of follow-up data for two of the three participants and contributed to variability of intervention dosage. The total number of views ranged from five to ten, which raises another confound in the data. It should be noted that frequency (i.e., views per week) has been well-explored in the literature, but guidelines for total video views have not been identified. Overall, there were a number of factors that were difficult or impossible to control, raising questions of confounds for the obtained data.

While the study worked hard to establish interobserver reliability and uniform behavioral coding, it is also notable that it attempted to define a variable (i.e., productive initiation) that does not have a definition that is well established in the literature. While the definition utilized in this study was operationalized, identifying a point of peer comparison was difficult and it was ultimately determined to be more efficacious to compare the participants' progress against their own performances from baseline data. These limitations raise caution in understanding the results presented, but also provide guidance for future research in this area.

Future Directions

Additional research in video modeling for students with ABIs is strongly advised to include more stringent guidelines for participant settings in order to avoid some of the inconsistencies observed in this study. A specialized behavior classroom or the requirement of certain classroom management systems may be helpful. Students with ABIs can vary substantially in presentation, so this should be taken into account in developing inclusion criteria for students and their classroom settings. Additionally, the use of VSM to impact behaviors in the home environment may also be beneficial, as it has been suggested that family environment is a strong predictor of long-term outcomes for children with TBIs (Durber et al., 2017). Future students to explore these research questions would benefit from more uniform implementation and clarification of overall dosage of the intervention. This may be an appropriate area for further literature review or meta-analysis.

More research is also needed in assessing interventions for children who return to school after surviving brain tumors, as these are the second most commonly diagnosed cancers in children, and survival rates are increasing (Cheung et al., 2014; Donnan et al., 2015). Neuropsychological and behavioral presentations following treatment can vary widely (Begyn & Castillo, 2010), and VSM may provide a viable avenue of intervention, with its relatively high potential for customization. Self-efficacy is also a commonly impacted area for childhood cancer survivors, and often for other children with ABIs as well (Gorin & McAuliffe, 2009; Scheenen, van der Horn, de Koning, van der Naalt, & Spikman, 2017). Scheenen and colleagues (2017) suggested that self-efficacy can play an important role in outcomes for individuals with TBIs. The present study raised questions regarding the potential of VSM to impact self-efficacy, although publications examining this directly could not be identified.

Additionally, future studies should seek to target initiation utilizing more established definitions. Reduced frustration tolerance is a common feature of ABI (Morrison, 2010), so building skills and habits in asking for help is a logical course of intervention. Similarly, research in building coping strategies for children with ABI through VSM would be beneficial. Peter's behavior in the present study raised questions of the possibility of exploring the use of VSM to increase coping skills more directly in a population that often shows the aforementioned frustration tolerance, combined with increased rates of aggression reduced inhibition (Morrison, 2010).

Finally, VSM may be of interest in researching recovery from ABI where procedures to relearn skills are concerned. Previous studies have explored VM and VSM to improve speech and functional skills after ABI (McGraw-Hunter, Faw, & Davis, 2006; Nikopoulos, Nikopoulou-Smyrni, & Knostantopoulos, 2013). In the present study, Bruce had learned to write with his previously nondominant left hand, and had an accommodation that allowed dictation to his teacher. After the start of the intervention, he was observed and reported to be completing his writing independently and without accessing his dictation accommodation. This was not measured directly, and thus not reported in the results; however, it raised significant questions about the possibility of using VSM as a rehabilitative intervention to build toward skill levels that were established prior to acquisition of the injury.

Implications for School Psychologists and Other Educators

The present study is not sufficient to draw firm conclusions about the efficacy of VSM for students with ABIs, but it does support previous guidelines that interventions should be selected from those researched with similar behavioral and cognitive profiles, such as students with ADHD (Kehle et al., 1997). While school intervention research for students with ABIs is sparse (Morrison, 2010), educational teams are still mandated to provide a Free and Appropriate Public Education (FAPE) to these students (IDEA, 2014), and this mandate highlights the need for viable intervention strategies to improve these students' classroom behavior. VSM requires an initial time investment, but is easy to implement after the video is created because of the increased presence of laptops, tablets and other video playback-capable devices in classroom settings. Furthermore, it was generally acceptable to teachers, with students reporting acceptability as well. Peter asked his teachers why he could not watch his video every day and often remembered to watch it at the determined time without being reminded. Bruce's teacher commented that the intervention was "oddly easy" after the initial setup had been completed. At check-ins with the author, teachers did not report a need for additional support and each noted that students were able to access their videos on the iPad with minimal to no assistance. Because VSM presents minimal risk, it may be a viable option for educational teams to attempt with students with ABIs as the research around it continues to progress. Furthermore, VSM presents ample opportunity for customization, increasing its utility for educational teams as behavioral and cognitive presentations of students with ABIs can vary substantially (D'Amato & Rothlisberg, 1997; Morrison, 2010). Teams will need to establish clear and consistent systems to monitor students' responses to this intervention, as further research is still greatly needed with this population.

APPENDIX A

RECRUITMENT LETTERS AND CONSENT FORMS

Study Information Letter for Parents

Dear Parent,

I am writing to inform you about a research project through the University of Utah that is underway in Jordan School District. You are being contacted because your child may be eligible to participate in our study. We are testing the effectiveness of a video self-modeling intervention with students who have experienced traumatic brain injuries. You will be asked to complete a couple of behavioral questionnaires as part of screening for study eligibility. Students who participate in the study will work with Mrs. Pflieger in behavioral skills training and create a video that shows them being actively engaged and on-task. Mrs. Pflieger will also consult with your child's teacher over the course of the intervention. A member of the research team will set times with the teacher so that we can collect observational data and the intervention will last approximately six weeks.

If your child has a history of traumatic brain injury, is in first through sixth grade and is struggling to stay on-task and ask questions in class, he/she may be a candidate for our study. If you would like to know more about the study, please contact Courtney Pflieger at 405-512-4362 or courtney.pflieger@utah.edu. Participation is completely voluntary; contacting us with questions about the study does not enroll your child in the study or obligate him/her to participate. If we do not hear from you regarding whether you would like your child to participate, we may contact you via phone. You may opt out of further contact by contacting Mrs. Pflieger and requesting that no further contact be made.

Thank you for your time and consideration of our study.

Best regards,

Courtney Pflieger, M.Ed.
Doctoral Candidate in School Psychology
Department of Educational Psychology
University of Utah

Parental Permission for Study Participation

BACKGROUND
Your child is being asked to take part in a research study. Before you decide to have your child participate, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Please ask if there is anything that is not clear or if you would like more information. You are invited to contact Mrs. Pflieger directly with any questions. Take time to decide whether you will allow your child to take part in this study. Participation is completely voluntary and opting out of the study will not affect your child's educational plan or activities.

The purpose of the study is to test the effects of an established behavioral intervention with children with traumatic brain injuries. Video self-modeling has been found to be an effective tool for increasing on-task behavior, which is a target behavior of this study. Additionally, the intervention seeks to increase the child's habit of initiating in the classroom (e.g., participating in discussions, asking for help, etc.).

STUDY PROCEDURE
This study will be concluded after data have been collected for a total of four participants. It will be conducted over a period of roughly six weeks that your child is in school (meaning that off-track time will not be included). At the beginning of the study, you will be asked to complete some questionnaires to assess your child's behavior. This will take approximately 45 minutes. With your consent, a member of the research team will obtain consent from your child's classroom teacher and work with him/her to establish preferred times for an observer to be in the classroom. The teacher will also be asked to complete questionnaires similar to those you completed. A member of the research team will observe your child so that we can collect data on your child's level of academic participation without our intervention. After these data have been collected, the intervention will begin if your child meets screening criteria. If your child does not meet these criteria, his/her participation in the study will be terminated. Data collection will begin with a member of the research team observing your child multiple times to determine his/her pattern of classroom participation. After these observations, your child will attend a one-on-one session with Mrs. Pflieger and receive behavioral skills training to encourage him/her to ask questions in class and seek help when he/she does not understand something. This session will take place during the school day unless you would like to arrange a time after school. Mrs. Pflieger will also work with your child, his/her teacher and two students from the class to create a video of your child working hard on an assigned task and asking for help appropriately (e.g., raising his/her hand, waiting for the teacher to approach, asking the question, listening to the answer and then continuing with his/her work).

It will take no more than 30 minutes to make this video and we will do this during a time outside of core instruction. The video will be 4-5 minutes in length and your child will view it at school 3-5 times each week. The researchers will provide the means for this to occur, and you will not be asked to provide any kind of technology or other equipment. A member of the research team will observe your child in the classroom 2-5 times per week to assess whether the intervention is having an effect on his/her level of engagement. This will also allow us to watch for any unintended consequences that may require us to change or discontinue the intervention. Mrs. Pflieger will also consult with your child's teacher to facilitate positive reinforcement when your child is on-task and asking questions. Ideally, this reinforcement will be praise from the teacher (e.g., "Jimmy, I am so proud of how hard you are working!"). If praise is not motivating for your child, Mrs. Pflieger will work with you and your child's teacher to find a suitable alternative (e.g., bonus points or tickets toward a prize). Over the course of roughly six weeks, we will decrease the number of times that your child views the video each week. If that six weeks ends and there is still time during the school year, we will observe your child again to see if changes in their behavior have been maintained. You and your child's teacher will then be asked to complete another set of questionnaires assessing your child's behavior. At the conclusion of the study, all videos and back up files of the videos will be destroyed to ensure your child's privacy.

RISKS
The risks of the study are minimal. Your child may feel singled out when the video is filmed and he/she is separated from the class to review the 4-5 minute video. These risks are similar to those experienced during other interventions that are individualized for specific students. You will be provided with Mrs. Pflieger's contact information and are invited to communicate any concerns that may arise throughout the course of the study.

BENEFITS
We cannot promise any direct benefit to your child for taking part in this study, as we are evaluating the effectiveness of an intervention. However, there are several potential benefits. Your child's level of participation at school may improve. This can help your child to feel more confident about his/her academic abilities. Your child may also feel more supported due to additional attention from research personnel and his/her teacher. If our study indicates that this intervention is effective for children with traumatic brain injuries, it may become a resource for other students with traumatic brain injuries and the school staff who work with them.

ALTERNATIVE PROCEDURES
If your child's scores on any of the measures used reveal problems and you decide you do not want your child to be in the study, you may consult with your child's teacher, administrators and school psychologist to address your concerns regarding his/her behavior at school.

CONFIDENTIALITY
The study will lend an iPad to your child's teacher so that your child can view the self-modeling video regularly. A copy of the video will be stored on the iPad, which will have a passcode that only the teacher and research team will know. Teachers will also be asked to keep the iPad in a locked cabinet or desk when not in use. Backup copies of the videos will be kept in a Health Insurance Portability and Accountability Act (HIPAA)- and Family Education Rights and Privacy Act (FERPA)-compliant, password-protected cloud

storage. These videos will be destroyed at the end of the study and the iPads will be reset to factory settings. The iPads for the study are not iCloud-enabled and will not connect to the internet during the study, preventing the creation of unauthorized back-up copies. All written documentation of your child's participation will be kept in a locked cabinet. Observation forms will record only your child's initials. If the study is published, your child's name will be replaced with a pseudonym and the names of teachers, schools and the school district will not be used. If you contact Mrs. Pflieger via email, your message will be sent to her secure University of Utah account. You will be provided with Mrs. Pflieger's phone number as well, and should be advised that it is a cellular phone registered with Verizon Wireless.

Working one-on-one with children provides opportunities for them to disclose information about themselves and their families. Any information that is not relevant to the study will not be documented, although we will document information that may help the intervention; e.g., things your child finds motivating or difficult at school. If your child shares personal information, it will not be repeated. The exception to this is if a child reports instances of abuse, neglect or self-harm. If researchers have reason to believe that the child is at risk of harm or neglect, we must report these instances to the Division of Child and Family Services (DCFS) or the nearest law enforcement agency to the extent required by law.

PERSON TO CONTACT
If you have questions, complaints or concerns about this study, you can contact Courtney Pflieger at 405-512-4362 or courtney.pflieger@utah.edu between the hours of 9 am and 8 pm, Sunday through Friday. If you feel your child has been harmed as a result of participation, please call Aaron Fischer, Ph.D., BCBA at 801-587-1842, who may be reached during normal business hours (9 am-5 pm, Monday through Friday).

Institutional Review Board: Contact the Institutional Review Board (IRB) if you have questions regarding your rights as a research participant or if you have questions, complaints or concerns which you do not think you can discuss with the investigator. The University of Utah IRB may be reached by phone at (801) 581-3655 or by e-mail at irb@hsc.utah.edu.

Research Participant Advocate: You may also contact the Research Participant Advocate (RPA) by phone at (801) 581-3803 or by email at participant.advocate@hsc.utah.edu.

VOLUNTARY PARTICIPATION
This study is completely voluntary and you can tell us that you do not want your child to participate in this study. Your child can start the study and choose to stop later. This will not affect your relationship with the investigator.

COSTS AND COMPENSATION TO PARTICIPANTS
The primary cost for participation is time. You will spend 45 minutes on two separate occasions to complete behavioral surveys. Your child will spend an hour in behavioral

skills training, roughly 30 minutes creating the self-modeling video, and up to 25 minutes per week viewing the video.

There is no compensation for participating in this study.

CONSENT
By signing this consent form, I confirm that I have read the information in this parental permission form and have had the opportunity to ask questions. I will be given a signed copy of this parental permission form. I voluntarily agree to allow my child to take part in this study.

____
Child's Name

____
Parent/Guardian's Name

____ __________________
Parent/Guardian's Signature Date

____
Relationship to Child

____
Name of Person Obtaining Consent

____ __________________
Signature of Person Obtaining Consent Date

Assent to Participate in a Research Study

Who are we and what are we doing?
We are from the University of Utah and we would like to ask you to be in a research study. A research study is a way to find out new information about something.

Why are we asking you to be in this research study?
We are asking you to be in this research study because we want to learn more about a way to help students like you learn a lot at school. We want you to be in this study because you have had a head injury and sometimes that can make school hard.

What happens in the research study?

For this research study, a member of our research team will come to your class sometimes. He or she will talk to your teacher and watch what happens in the class. You will also work together with Mrs. Pflieger to learn how to be a good student. Mrs. Pflieger will work with you, your teacher and two people from your class to make a short video that shows you being the very best student that you can be. We will make the video during a time when you are not in class, maybe during lunch or recess or after school. Your teacher will help you remember to watch the video at school so you can see yourself being a great student. Your teacher will let you know when you are practicing what you learned and are being a great student. Someone from our study won't come to see your class every day and you don't need to worry about making them happy when they do come. You can just pretend we aren't even there!

We want you to watch your video for six weeks and we might ask you questions about the things you like and the things you don't like. We will also ask your parents and your teacher some questions about you so that we can learn more about you and your experiences at school.

Will any part of the research study hurt you?

There is a chance that you could feel weird about some parts of our research study. You might be the only student in your class who has a video like the one we will make and that could feel strange or lonely. You might feel like we are keeping an eye on you since there will be someone from our study in your class and we are asking your parents and your teacher about you. We will help you pick some safe grownups that you can talk to if you feel this way, especially your parents, your teacher and Mrs. Pflieger.

Will the research study help you or anyone else?

We don't know for sure if being in this research study will help you. We might learn something new from working with you. Someday, that could help other people who have had head injuries.

Who will see the information about you?

Only researchers, your parents and your teacher will see information about you from this research study. When we make the video with your teacher and two students in your class, we will ask them not to talk about the study and we will tell them we are looking at ways to help kids do their best in school. We can tell them you are the "star" of our video, but we will not talk to them about your head injury or the things you, your parents and your teacher talk about with Mrs. Pflieger.

You are the only one in your class who will be allowed to watch the video we make. Your teacher and parents might watch it if they want to see what we are doing in the study. When we come to see you and your teacher, we will only write down the first letters of your first and last name. At the end of our study, the video will be completely erased. When we write about our research study and talk about our questions and what we learn, we will not use your name or the name of your teacher, your school or your school district.

If you talk to us about things besides being a good student and how you are doing in school, most of those things will not be repeated. If you tell us about anyone who is hurting you or that you want to hurt yourself, we will tell your parents and, if they need to know, other adults who can keep you safe. This is so that we can help you feel better and make sure you are o.k.

What if you have any questions about the research study?

It is okay to ask questions. If you don't understand something, you can ask us. We want you to ask questions now and anytime you think of them. If you have a question later that you didn't think of now, you can call Mrs. Pflieger at 405-512-4362 or ask us the next time we see you. If you think of a question, you can also write it down to make sure you remember it later.

Do you have to be in the research study?

You do not have to be in this study if you don't want to. Being in this study is up to you. No one will be upset if you don't want to do it. Even if you say yes now, you can change your mind later and tell us you want to stop. You can take your time to decide. You can talk to your parent or guardian about it too. We will also ask your parent/guardian to give permission for you to be in this study. Even if they say "yes," you can still decide not to be in the research study. Your teacher will keep working with you, even if you decide not to be in this research study.

Agreeing to be in the study

I was able to ask questions about this study. Signing my name at the bottom means that I agree to be in this study. My parent or guardian and I will be given a copy of this form after I have signed it.

____
Printed Name

____ ______________________
Sign your name on this line Date

____
Printed Name of Person Obtaining Assent

____ ______________________
Signature of Person Obtaining Assent Date

The following should be completed by the study member conducting the assent process if the participant agrees to be in the study. Initial the appropriate selection:

_________ The participant is capable of reading the assent form and has signed above as documentation of assent to take part in this study.

_________ The participant is not capable of reading the assent form, but the information was verbally explained to him/her. The participant signed above as documentation of assent to take part in this study.

Parental Permission to Participate in Modeling Video

BACKGROUND

Your child is being asked to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Please ask if there is anything that is not clear or if you would like more information. You are invited to contact Mrs. Pflieger directly with any questions. Take time to decide whether you will allow your child to take part in this study. Participation is completely voluntary and opting out of the study will not affect your child's educational plan or activities.

The purpose of the study is to test the effects of an established behavioral intervention with children with traumatic brain injuries. Video self-modeling has been found to be an effective tool for increasing on-task behavior, which is a target behavior of this study. Additionally, the intervention seeks to increase the child's habit of initiating in the classroom (e.g., participating in discussions, asking for help, etc.).

STUDY PROCEDURE

This study will be concluded after data have been collected for all participants. It will be conducted over a period of roughly six weeks that your child is in school (meaning that off-track time will not be included in the study time). If you are reviewing this consent form, a student in your child's class has been selected to experience the intervention. Part of the intervention involves creating a video of the child staying on-task and exhibiting behaviors that promote academic engagement. Other children appear in the video to provide everyday distractions (e.g., sharpening a pencil, bumping the student as they walk by) so that we can show the participant actively ignoring these distractions. Your child is being asked to participate as a peer who acts in the video. The video will be edited to be 4-5 minutes in length and should take approximately 30-45 minutes to film. Filming will take place outside regular academic time (e.g., lunch or recess) and the teacher will be part of that experience. The primary participant will review the video on a regular basis, typically 2-5 times per week. A researcher will also come to your child's classroom periodically to observe the primary participant in that environment. Your child will not be formally observed and no data on his/her behavior will be collected in our study.

RISKS

The risks of the study are minimal. Your child may feel singled out when the video is filmed and may feel strange knowing another student is watching a video that they helped create. These risks are similar to those experienced during other interventions that are individualized for specific students. You will be provided with Courtney Pflieger's contact information and are invited to communicate any concerns that may arise throughout the course of the study.

BENEFITS

We cannot promise any direct benefit to your child for taking part in this study, as we are evaluating the effectiveness of an intervention. However, there are several potential benefits. Your child may feel empowered as he/she will be viewed as helping in this research. If our study indicates that this intervention is effective for children with traumatic brain injuries, it may become a resource for other students with traumatic brain injuries and the school staff who work with them.

CONFIDENTIALITY
The study will lend an iPad to your child's teacher so that the primary participant can view the self-modeling video regularly. A copy of the video will be stored on the iPad, which will have a passcode that only the teacher and research team will know. Teachers will also be asked to keep the iPad in a locked cabinet or desk when not in use. Back-up copies of the videos will be kept in a Health Insurance Portability and Accountability Act (HIPAA)- and Family Education Rights and Privacy Act (FERPA)-compliant, password-protected cloud storage. These videos will be destroyed at the end of the study and the iPads will be reset to factory settings. The iPads for the study are not iCloud-enabled and will not connect to the internet during the study, preventing the creation of unauthorized back-up copies. All written documentation of your child's participation will be kept in a locked cabinet. In publications, all names will be substituted with pseudonyms and the names of teachers, schools and the school district will not be used. If you contact Mrs. Pflieger via email, your message will be sent to her secure University of Utah account. You will be provided with Mrs. Pflieger's phone number as well, and should be advised that it is a cellular phone registered with Verizon Wireless.

Working with children provides opportunities for them to disclose information about themselves and their families. If your child shares personal information, it will not be repeated. The exception to this is if a child reports instances of abuse, neglect or self-harm. If researchers have reason to believe that the child is at risk of harm or neglect, we must report these instances to the Division of Child and Family Services (DCFS) or the nearest law enforcement agency to the extent required by law.

PERSON TO CONTACT
If you have questions, complaints or concerns about this study, you can contact Courtney Pflieger at 405-512-4362 or courtney.pflieger@utah.edu between the hours of 9 am and 8 pm, Sunday through Friday. If you feel your child has been harmed as a result of participation, please call Aaron Fischer, Ph.D., BCBA at 801-587-1842, who may be reached during normal business hours (9 am-5 pm, Monday through Friday).

Institutional Review Board: Contact the Institutional Review Board (IRB) if you have questions regarding your rights as a research participant or if you have questions, complaints or concerns which you do not think you can discuss with the investigator. The University of Utah IRB may be reached by phone at (801) 581-3655 or by e-mail at irb@hsc.utah.edu.

Research Participant Advocate: You may also contact the Research Participant Advocate (RPA) by phone at (801) 581-3803 or by email at participant.advocate@hsc.utah.edu.

VOLUNTARY PARTICIPATION
This study is completely voluntary and you can tell us that you do not want your child to participate in this study. Your child can start the study and choose to stop later. This will not affect your relationship with the investigator.

COSTS AND COMPENSATION TO PARTICIPANTS
The primary cost for participation is time. Your child will spend approximately 30 minutes helping to film the video for the intervention. There is no compensation for participating in this study.

CONSENT
By signing this consent form, I confirm that I have read the information in this parental permission form and have had the opportunity to ask questions. I will be given a signed copy of this parental permission form. I voluntarily agree to allow my child to take part in this study.

____
Child's Name

____
Parent/Guardian's Name

____ ____________
Parent/Guardian's Signature Date

____
Relationship to Child

____
Name of Person Obtaining Consent

____ ___________
Signature of Person Obtaining Consent Date

Assent to be in a Video for a Research Study

Who are we and what are we doing?
We are from the University of Utah and we would like to ask you to be in a research study. A research study is a way to find out new information about something.

Why are we asking you to be in this research study?
We are asking you to be in this research study because we want to learn more about a way to help students learn as much as they can. We are asking you to be in the study so you can help us make a video that shows students doing their very best in class.

What happens in the research study?

For this research study, a member of our research team will come to your class sometimes. He or she will talk to your teacher and watch what happens in the class. Mrs. Pflieger will work with you, your teacher and two people from your class to make a short video that shows one student being a great student and other students doing something that might distract him/her. We will make the video during a time when you are not in class, maybe during lunch or recess or after school. We only need to make one video.

Will any part of the research study hurt you?

There is a chance that you could feel weird about some parts of our research study. Helping us make the video might be a new experience for you. You might feel strange knowing that we have a video with you in it. We will help you pick some safe grownups that you can talk to if you feel this way, especially your parents, your teacher and Mrs. Pflieger.

Will the research study help you or anyone else?

We don't know for sure if being in this research study will help you. We might learn something new from working with you. Someday, the things we learn might help other students do better in school.

Who will see the information about you?

Only researchers, your parents and your teacher will see information about you from this research study. When we make the video with your teacher and two students in your class, we will ask them not to talk about the study and we will tell them we are looking at ways to help kids do their best in school. Only your teacher, the researchers and the people who are in the video will be able to watch it.

If you talk to us about things besides being a good student and how you are doing in school, most of those things will not be repeated. If you tell us about anyone who is hurting you or that you want to hurt yourself, we will tell your parents and, if they need to know, other adults who can keep you safe. This is so that we can help you feel better and make sure you are o.k.

What if you have any questions about the research study?

It is okay to ask questions. If you don't understand something, you can ask us. We want you to ask questions now and anytime you think of them. If you have a question later that you didn't think of now, you can call Mrs. Pflieger at 405-512-4362 or ask us the next time we see you. If you think of a question, you can also write it down to make sure you remember it later.

Do you have to be in the research study?

You do not have to be in this study if you don't want to. Being in this study is up to you. No one will be upset if you don't want to do it. Even if you say yes now, you can change your mind later and tell us you want to stop. You can take your time to decide. You can talk to your parent or guardian about it too. We will also ask your parent/guardian to give permission for you to be in this study. Even if they say "yes," you can still decide not to be in the research study. Your teacher will keep working with you, even if you decide not to be in this research study.

Agreeing to be in the study

I was able to ask questions about this study. Signing my name at the bottom means that I agree to be in this study. My parent or guardian and I will be given a copy of this form after I have signed it.

____

Printed Name

____ ______________________

Sign your name on this line Date

____

Printed Name of Person Obtaining Assent

____ ______________________

Signature of Person Obtaining Assent Date

The following should be completed by the study member conducting the assent process if the participant agrees to be in the study. Initial the appropriate selection:

___________	The participant is capable of reading the assent form and has signed above as documentation of assent to take part in this study.
___________	The participant is not capable of reading the assent form, but the information was verbally explained to him/her. The participant signed above as documentation of assent to take part in this study.

Parental Permission to Participate in Study Training Video

BACKGROUND
Your child is being asked to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Please ask if there is anything that is not clear or if you would like more information. You are invited to contact Mrs. Pflieger directly with any questions. Take time to decide whether you will allow your child to take part in this study. Participation is completely voluntary and opting out of the study will not affect your child's educational plan or activities.

The purpose of the study is to test the effects of an established behavioral intervention with children with traumatic brain injuries. Video self-modeling has been found to be an effective tool for increasing on-task behavior, which is a target behavior of this study. Additionally, the intervention seeks to increase the child's habit of initiating in the classroom (e.g., participating in discussions, asking for help, etc.). In order to assess progress during the study, observers need to be trained in coding behaviors consistently.

STUDY PROCEDURE
The purpose of this permission form is to identify students that can participate in creating a video to train researchers for the aforementioned study. Your child has not been selected for any kind of intervention from the study or contact with the researchers outside the day of filming. If you are reviewing this consent form, your school's principal has agreed to allow the researcher to create a training video with students whose parents provide permission for them to be recorded. The purpose of the video is the train observers for the study and help build consistency between observers so that they can then provide reliable data for children with traumatic brain injuries. The training video will require roughly 45 minutes of video recording of students going through normal classroom routines. During filming, students will be asked to do regular classroom assignments and act as they normally do in school. The video will then be reviewed by observers to train in how to code specific behaviors that promote positive classroom engagement. At the conclusion of the study, the training video will be destroyed to ensure privacy is maintained for the students who helped create it.

RISKS
The risks of the study are minimal. Your child may feel singled out when the video is filmed and may feel strange knowing adults are watching a video that they helped create. These risks are similar to those experienced during other interventions that utilize video recordings. You will be provided with Courtney Pflieger's contact information and are invited to communicate any concerns that may arise throughout the course of the study.

BENEFITS
We cannot promise any direct benefit to your child for taking part in this study, as we are evaluating the effectiveness of an intervention with a different set of participants. However, there are several potential benefits. Your child may feel empowered as he/she will be viewed as helping in this research. If our study indicates that this intervention is

effective for children with traumatic brain injuries, the research may become a resource for other students with traumatic brain injuries and the school staff who work with them.

CONFIDENTIALITY

The training video will be kept in a Health Insurance Portability and Accountability Act (HIPAA)- and Family Education Rights and Privacy Act (FERPA)-compliant, password-protected cloud storage. All written documentation of your child's participation will be kept in a locked cabinet. In publications, all names will be substituted with pseudonyms and the names of teachers, schools and the school district will not be used. If you contact Mrs. Pflieger via email, your message will be sent to her secure University of Utah account.

Working with children provides opportunities for them to disclose information about themselves and their families. If your child shares personal information, it will not be repeated. The exception to this is if a child reports instances of abuse, neglect or self-harm. If researchers have reason to believe that the child is at risk of harm or neglect, we must report these instances to the Division of Child and Family Services (DCFS) or the nearest law enforcement agency to the extent required by law.

PERSON TO CONTACT

If you have questions, complaints or concerns about this study, you can contact Courtney Pflieger at courtney.pflieger@utah.edu between the hours of 9 am and 8 pm, Sunday through Friday. If you feel your child has been harmed as a result of participation, please call Aaron Fischer, Ph.D., BCBA at 801-587-1842, who may be reached during normal business hours (9 am-5 pm, Monday through Friday).

Institutional Review Board: Contact the Institutional Review Board (IRB) if you have questions regarding your rights as a research participant or if you have questions, complaints or concerns which you do not think you can discuss with the investigator. The University of Utah IRB may be reached by phone at (801) 581-3655 or by e-mail at irb@hsc.utah.edu.

Research Participant Advocate: You may also contact the Research Participant Advocate (RPA) by phone at (801) 581-3803 or by email at participant.advocate@hsc.utah.edu.

VOLUNTARY PARTICIPATION

This study is completely voluntary and you can tell us that you do not want your child to participate in this study. Your child can start the study and choose to stop later. This will not affect your relationship with the investigator.

COSTS AND COMPENSATION TO PARTICIPANTS

The primary cost for participation is time. Your child will spend approximately 45 minutes helping to film the training video. There is no compensation for participating in this study.

CONSENT

By signing this consent form, I confirm that I have read the information in this parental permission form and have had the opportunity to ask questions. I will be given a signed copy of this parental permission form. I voluntarily agree to allow my child to take part in this study.

____
Child's Name

____
Parent/Guardian's Name

_____________________________________ _______________
Parent/Guardian's Signature Date

____
Relationship to Child

____
Name of Person Obtaining Consent

______________________________________ ___________________
Signature of Person Obtaining Consent Date

Assent to be in a Training Video for a Research Study

Who are we and what are we doing?
We are from the University of Utah and we would like to ask you to be in a research study. A research study is a way to find out new information about something.

Why are we asking you to be in this research study?
We are asking you to be in this research study because we want to learn more about a way to help students learn as much as they can. We are asking you to be in the study so you can help us make a video of regular classroom activities so we can train the adults to watch for certain things in a classroom.

What happens in the research study?

For this research study, Mrs. Pflieger will come to your school and find a place for you and other students to do work and other things you normally do in class. She will record you and the other students working to get a good idea of what a normal day in the classroom looks like.

Will any part of the research study hurt you?

There is a chance that you could feel weird about some parts of our research study. Helping us make the video might be a new experience for you. You might feel strange knowing that we have a video with you in it. We will help you pick some safe grownups that you can talk to if you feel this way, especially your parents, your teacher and Mrs. Pflieger.

Will the research study help you or anyone else?

We don't know for sure if being in this research study will help you. We might learn something new from working with you. Someday, the things we learn might help other students do better in school.

Who will see the information about you?

Only researchers will see the video we are making. We will delete the video at the end of our research study so that it stays private when we are done. We will make sure to keep the video private during the study.

If you talk to us about things besides being a good student and how you are doing in school, most of those things will not be repeated. If you tell us about anyone who is hurting you or that you want to hurt yourself, we will tell your parents and, if they need to know, other adults who can keep you safe. This is so that we can help you feel better and make sure you are o.k.

What if you have any questions about the research study?

It is okay to ask questions. If you don't understand something, you can ask us. We want you to ask questions now and anytime you think of them. If you have a question later that you didn't think of now, you can call Mrs. Pflieger at 405-512-4362 or ask us the next time we see you. If you think of a question, you can also write it down to make sure you remember it later.

Do you have to be in the research study?

You do not have to be in this study if you don't want to. Being in this study is up to you. No one will be upset if you don't want to do it. Even if you say yes now, you can change your mind later and tell us you want to stop. You can take your time to decide. You can talk to your parent or guardian about it too. We will also ask your parent/guardian to give permission for you to be in this study. Even if they say "yes," you can still decide not to be in the research study. Your teacher will keep working with you, even if you decide not to be in this research study.

Agreeing to be in the study

I was able to ask questions about this study. Signing my name at the bottom means that I agree to help make the training video for the study. My parent or guardian and I will be given a copy of this form after I have signed it.

____

Printed Name

____ ______________________

Sign your name on this line Date

____

Printed Name of Person Obtaining Assent

____ ______________________

Signature of Person Obtaining Assent Date

The following should be completed by the study member conducting the assent process if the participant agrees to be in the study. Initial the appropriate selection:

___________ The participant is capable of reading the assent form and has signed above as documentation of assent to take part in this study.

___________ The participant is not capable of reading the assent form, but the information was verbally explained to him/her. The participant signed above as documentation of assent to take part in this study.

Information Letter for Teachers

Re: *Video self-modeling with elementary school students demonstrating behavioral engagement deficits due to traumatic brain injury,* by Courtney Pflieger

Dear Teacher,

I am writing to inform you about a research project through the University of Utah that is underway in Jordan School District. You are being contacted because one of your students may be eligible to participate in our study. We are testing the effectiveness of a video self-modeling intervention with students who have experienced traumatic brain injuries. You will be asked to complete a couple of behavioral questionnaires as part of screening for study eligibility. Students who participate in the study will work with Mrs. Pflieger in behavioral skills training and create a video that shows them being actively engaged and on-task. Mrs. Pflieger will also consult with you over the course of the intervention. A member of the research team will set times with you so that we can collect observational data and the intervention will last approximately six weeks. Observations in your classroom are for research purposes only and will not be shared with your administrators, coworkers or anyone involved in your performance review process.

If you would like to know more about the study, please contact Courtney Pflieger at 405-512-4362 or courtney.pflieger@utah.edu. Contacting us with questions about the study does enroll constitute your consent to participate in the study or obligate you to participate. Participation is completely voluntary. If we do not hear from you regarding whether you would like to participate, we may contact you via phone. You may opt out of further contact by contacting Mrs. Pflieger and requesting that no further contact be made regarding the study.

Thank you for your time and consideration of our study.

Best regards,

Courtney Pflieger, M.Ed.
Doctoral Candidate in School Psychology
Department of Educational Psychology
University of Utah

Teacher Consent to Participate in Research Study

BACKGROUND

You are being asked to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Please ask if there is anything that is not clear or if you would like more information. You are invited to contact Mrs. Pflieger directly with any questions. Take time to decide whether you will to take part in this study. Participation is completely voluntary.

The purpose of the study is to test the effects of an established behavioral intervention with children with traumatic brain injuries. Video self-modeling has been found to be an effective tool for increasing on-task behavior, which is a target behavior of this study. Additionally, the intervention seeks to increase the child's habit of initiating in the classroom (e.g., participating in discussions, asking for help, etc.).

STUDY PROCEDURE

This study will conclude when data have been collected for all participants. It will be conducted over a period of roughly six weeks that your class is in school (meaning that off-track time will not be included). At the beginning of the study, you will be asked to complete some questionnaires to assess the behavior of one of your students. This will take approximately 45 minutes. A member of the research team will work with you to select times that we can come to observe the child to collect data regarding their current level of engagement in the classroom. After these data have been collected, the intervention will begin. The child will attend a one-on-one session with Courtney Pflieger and receive behavioral skills training to encourage him/her to ask questions in class and seek help when he/she does not understand something. This session will take place during the school day unless otherwise arranged by the parent. Mrs. Pflieger will also work with your, the student and two other students from the class to create a video of your student working hard on an assigned task and asking for help appropriately (e.g., raising his/her hand, waiting for the teacher to approach, asking the question, listening to the answer and then continuing with his/her work). You will be asked to recommend the two additional students who will appear in the video.

It will take no more than 30 minutes to make this video and we will do this during a time outside of core instruction. The video will be 4-5 minutes in length and your student will view it at school 3-5 times each week. The researcher will work with you to develop a schedule for the child to view the video and you will be asked to remind him/her to do so. The researchers will provide means for this to occur, and you will not be asked to provide any of your own technology or other equipment. A member of the research team will observe the child in the classroom 2-5 times per week to assess whether the intervention is having an effect on his/her level of engagement. This will also allow us to watch for any unintended consequences that may require us to change or discontinue the intervention. Mrs. Pflieger will consult with you to facilitate positive reinforcement when the child is on-task and asking questions. Ideally, this reinforcement will be praise (e.g., "Jimmy, I am so proud of how hard you are working!"). If praise is not motivating for the child, Mrs. Pflieger will work with you and the child's parent to find a suitable alternative (e.g., bonus points or tickets toward a prize). Over the course of roughly six weeks, we will decrease the number of times that the child views the video each week. If that six weeks ends and there is still time during the school year, we will observe the child again to see if changes in their behavior have been maintained. You will then be asked to complete another set of questionnaires assessing the child's behavior. At the conclusion of the study, all video files will be destroyed.

RISKS
The risks of the study are minimal. You may feel stress having an observer in your classroom and consulting with the researcher. Please know that observations and consultative experiences will not be relayed to your administrators or coworkers. You will be provided with Courtney Pflieger's contact information and are invited to communicate any concerns that may arise throughout the course of the study.

BENEFITS
We cannot promise any direct benefit to your student for taking part in this study, as we are evaluating the effectiveness of an intervention. However, there are several potential benefits. The child's level of engagement at school may improve. This can help him/her to feel more confident about his/her academic abilities. He/She may also feel more supported due to additional attention from research personnel and his/her teacher. You may see a positive change in the child's behavior while he/she is in your classroom. If our study indicates that this intervention is effective for children with traumatic brain injuries, it may become a resource for other students with traumatic brain injuries and the school staff who work with them.

CONFIDENTIALITY
The study will lend an iPad to you so that the student can view the self-modeling video regularly. A copy of the video will be stored on the iPad, which will have a passcode that only you and research team will know. Teachers will also be asked to keep the iPad in a locked cabinet or desk when not in use. Back-up copies of the videos will be kept in a Health Insurance Portability and Accountability Act (HIPAA)- and Family Education Rights and Privacy Act (FERPA)-compliant, password-protected cloud storage. These videos will be destroyed at the end of the study, and the iPads will be reset to factory settings. The iPads for the study are not iCloud-enabled and will not connect to the internet during the study, preventing the creation of unauthorized back-up copies. All written documentation of your participation will be kept in a locked cabinet. In publications, the students will be assigned pseudonyms and your name and the name of the school and district will not be used. If you contact Mrs. Pflieger via email, your message will be sent to her secure University of Utah account. You will be provided with Mrs. Pflieger's phone number as well and should be advised that it is a cellular phone registered with Verizon Wireless.

Working one-on-one with children provides opportunities for them to disclose information about themselves and their families. Any information that is not relevant to the study will not be documented (we will document things that may help the intervention, such as things the child finds motivating or difficult at school). If the child shares personal information, it will not be repeated. The exception to this is if a child reports instances of abuse, neglect or self-harm. If researchers have reason to believe that the child is at risk of harm or neglect, we must report these instances to the Division of Child and Family Services (DCFS) or the nearest law enforcement agency to the extent required by law.

PERSON TO CONTACT
If you have questions, complaints or concerns about this study, you can contact Courtney Pflieger at 405-512-4362 or courtney.pflieger@utah.edu between the hours of 9 am and 8 pm, Sunday through Friday. If you feel your student has been harmed as a result of participation, please call Aaron Fischer, Ph.D., BCBA at 801-587-1842, who may be reached during normal business hours (9 am-5 pm, Monday through Friday).

Institutional Review Board: Contact the Institutional Review Board (IRB) if you have questions regarding your rights as a research participant, or if you have questions, complaints or concerns which you do not think you can discuss with the investigator. The University of Utah IRB may be reached by phone at (801) 581-3655 or by e-mail at irb@hsc.utah.edu.

Research Participant Advocate: You may also contact the Research Participant Advocate (RPA) by phone at (801) 581-3803 or by email at participant.advocate@hsc.utah.edu.

VOLUNTARY PARTICIPATION
This study is completely voluntary and you can tell us if you do not wish to participate in this study. You can choose to start the study and stop. This will not affect your relationship with the investigator, and researchers will not communicate details of your participation with your administrators or coworkers.

COSTS AND COMPENSATION TO PARTICIPANTS
The primary cost for participation is time. You will spend 45 minutes on two separate occasions to complete behavioral surveys. It will also take roughly 30 minutes to create the self-modeling video, and you will spend approximately 15 minutes each week consulting and checking in with the researcher.

There is no compensation for participating in this study.

CONSENT
By signing this consent form, I confirm that I have read the information in this permission form and have had the opportunity to ask questions. I will be given a signed copy of this permission form. I voluntarily agree to take part in this study.

____
Printed Name of Participant

_______________________________ _______________________
Signature of Participant Date

____
Printed Name of Person Obtaining Consent

_______________________________ _______________________
Signature of Person Obtaining Consent Date

APPENDIX B

OBSERVATION FORM

ALTERNATE RESPONSE-DISCREPANCY OBSERVATION FORM

Student: ______________________ Grade: ______________________
School: ______________________ Date: ______________________
Observer: ______________________ Time Observation Started: ____________
Setting: ______________________ Time Observation Stopped: ____________

Behaviors That Will Be Noted During Observation:

Classroom Activity(ies) During Observation:

Explicit Class Rules in Effect During the Observation:

Length of Interval Used in This Observation = ____ Seconds

Behavior Codes:

T = On Task
V = Verbal Off Task
M = Motor Off Task
P = Passive Off Task
=
=

Teacher Reaction Codes:

AA = Attention to All
A+ = Positive Attention to Pupil
A- = Negative Attention to Pupil
Ao = No Attention to Pupil
An = Neutral Attention to Pupil
=
=

Select a comparison student of the same sex as the child who is the subject of the observation.

Pupil																								
Comparison																								
Teacher Reaction																								

Notes:

Pupil																								
Comparison																								
Teacher Reaction																								

Notes:

Pupil																								
Comparison																								
Teacher Reaction																								

Notes:

Summary: Pupil ______________ Comparison ______________
Teacher Reaction ______________________________

Comments:

APPENDIX C

SELF-MODELING VIDEO SCRIPTS

Bruce's Self-Modeling Video Script

Three students are in the frame, working on their class work, Bruce is seated in the middle.

Bruce: [Raises hand and looks at the teacher]

Teacher: [Moves to the participant and says quietly] Do you have a question, Bruce?
Bruce: Yes. Can you please help me with this one? [points to question on the page]
Teacher: I'm so glad that you asked for help, let's take a look. [clarifies the next step]

Bruce: Thank you. [continues working, 15 seconds of on-task footage follow]
Peer: Oops! That doesn't go there.
Bruce: [continues working on assignment]

After one minute of independent work, the student on Bruce's right gets up and uses the pencil sharpener (heard in the background).

Peer: [goes to pencil sharpener and, out of the frame, a pencil sharpener can be heard]
Bruce: [continues working through noise in another area of the classroom]
Peer: [returns to the frame, sits down and continues working]

Another 30 seconds of on-task footage is displayed. The teacher enters the frame.

Teacher: You are all doing a great job staying focused on your work. Very well done.
Bruce: [Raises hand and looks at the teacher]
Teacher: Yes, Bruce?
Bruce: I'm getting frustrated because the other kids are ahead of me.
Teacher: That's ok, I know that it takes you a little longer. Just keep working until the time is up for everybody and then we'll look at that assignment, you can put it in your cubby, ok?

Bruce: [nods]

Teacher: Keep at it and just get as much done as you can. Good job.

End recording.

Peter's Video Script

Students enter the classroom quietly and take their seats at their table

Teacher: [gives out worksheet] "Ok boys and girls, I need you to get right to work. Please raise your hand if you have a question."

Students: Begin working on assignment. After 30-45 seconds, Student One leaves his or her seat and bumps Peter on their way.

Peter stays focused on his work.

Student one returns to his seat and Peter keeps working on his paper.

Students continue working for 30-45 seconds.

Teacher: "Wow! Peter, you're doing a great job staying focused on your work"

Students continue working for 20-30 seconds.

Peter: *[Raises hand] waits 3-5 seconds.*

Teacher: "Yes, Peter? "

Peter: "When do I get to be on the computer?"

Teacher: "Thank you for asking so patiently. Go look at the clipboard and look at where we are right now. You can bring it to me if you need help."

Peter: *[Gets clipboard with picture schedule]* Ok, here's what we're doing right now, so I get computer time after I finish my ______________.

Peter returns to his seat and continues working.

End.

Note: Footage of Peter naming and demonstrating his calming steps was added after we acquired video based on the script above was taken. The steps were as follows:

1. Stop and take a deep breath
2. Name your feeling
3. Count to five
4. Talk to yourself: "I can do it, I can listen"
5. Follow the direction

Jean's video script

Three students are in the frame, working on their class work while Teacher moves around the classroom. Jean is seated in the middle.

Jean: [Raises hand and looks at the Teacher]

Teacher: [Moves toward Jean and says quietly] Do you have a question about the assignment?

Jean: Yes. Can you please help me with this one? [points to specified question on the page]

Teacher: I'm so glad that you asked for help appropriately. Let's take a look. [clarifies the next step for the question]

Jean: Thank you. [continues working]

After one minute of independent work, the student on the Jean's right gets up, bumping her arm.

Peer: Oops.

Jean: [continues working on assignment]

Peer: [moves loudly toward pencil sharpener and, out of the frame, a pencil sharpener can be heard]

Jean: [continues working through noise in another area of the classroom]

Peer: [returns to the frame, sits down noisily and continues working]

Another 30 seconds of on-task footage is displayed. Teacher enters the frame.

Teacher: Jean, you are doing great staying focused, I'm so proud of you!

Another 15 seconds of on-task footage is displayed.

End.

APPENDIX D

USER RATING PROFILE-INTERVENTION

Usage Rating Profile-Intervention (URP-I)

		Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1.	The amount of time required to use this intervention is reasonable.	1	2	3	4	5	6
2.	I would implement this intervention with a good deal of enthusiasm.	1	2	3	4	5	6
3.	The intervention could be implemented for the duration of time as prescribed.	1	2	3	4	5	6
4.	The amount of time required for record keeping with this intervention is reasonable.	1	2	3	4	5	6
5.	I am motivated to try this intervention.	1	2	3	4	5	6
6.	I would need consultative support to implement this intervention.	1	2	3	4	5	6
7.	All pieces of this intervention could be implemented precisely.	1	2	3	4	5	6
8.	The intervention could be implemented with the intensity as prescribed.	1	2	3	4	5	6
9.	I would have positive attitudes about implementing this intervention.	1	2	3	4	5	6
10.	I understand the procedures of this intervention.	1	2	3	4	5	6
11.	I would know what to do if I was asked to implement this intervention.	1	2	3	4	5	6
12.	Overall, the intervention is beneficial for the child.	1	2	3	4	5	6
13.	Implementation of this intervention would require support from my co-workers.	1	2	3	4	5	6
14.	Parental collaboration is required in order to use this intervention.	1	2	3	4	5	6
15.	The requirements for implementing this intervention are unclear.	1	2	3	4	5	6
16.	I would not be interested in implementing this intervention.	1	2	3	4	5	6
17.	The intervention could be implemented exactly as described.	1	2	3	4	5	6
18.	This intervention is a good way to handle the child's behavior problem.	1	2	3	4	5	6

		Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
19.	I could only implement this intervention with assistance from other adults.	1	2	3	4	5	6
20.	The intervention is a fair way to handle the child's behavior problem.	1	2	3	4	5	6
21.	This intervention is reasonable for the problem behavior described.	1	2	3	4	5	6
22.	I could implement this intervention by myself.	1	2	3	4	5	6
23.	I would need support from my administrator to implement this intervention.	1	2	3	4	5	6
24.	I would be resistant to use this intervention.	1	2	3	4	5	6
25.	This intervention could be implemented as frequently as described.	1	2	3	4	5	6
26.	This is an acceptable intervention strategy for the child's problem behavior.	1	2	3	4	5	6
27.	I am knowledgeable about the intervention procedures.	1	2	3	4	5	6
28.	This intervention is an effective choice for addressing a variety of problems.	1	2	3	4	5	6
29.	This intervention would not be disruptive to other students.	1	2	3	4	5	6
30.	I have the skills needed to implement this intervention.	1	2	3	4	5	6
31.	Use of this intervention would save time spent on classroom management.	1	2	3	4	5	6
32.	I understand how to use this intervention	1	2	3	4	5	6
33.	I liked the procedures used in this intervention.	1	2	3	4	5	6
34.	I would have no idea how to implement this intervention.	1	2	3	4	5	6
35.	The directions for using this intervention are clear to me.	1	2	3	4	5	6

URP- I SCORING GUIDE

Factor I: ACCEPTABILITY

Items - 2, 5, 9, 12, 16*, 18, 20, 21, 24*, 26, 28, 31, 33

Factor II: UNDERSTANDING

Items – 10, 11, 15*, 27, 30, 32, 34*, 35

Factor III: FEASIBILITY

Items – 1, 3, 4, 7, 8, 17, 25, 29

Factor IV: SYSTEMS SUPPORT

Items – 6, 13, 14, 19, 22*, 23

* REVERSE CODE THESE ITEMS

Note: LOW score for systems support reflects greater ability to independently implement the intervention [If aggregating across all factors to find an overall mean indicative of more favorable responses, consider reverse coding all items in this factor (except 22)] . For the remaining composites, HIGH scores are desirable.

Suggested citation for the associated publication is as follows:
Chafouleas, S.M., Briesch, A.M., Riley-Tillman, T.C., & McCoach, D.B. (2009). Moving beyond assessment of treatment acceptability: An examination of the factor structure of the Usage Rating Profile – Intervention (URP-I). *School Psychology Quarterly, 24*, 36-47.

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